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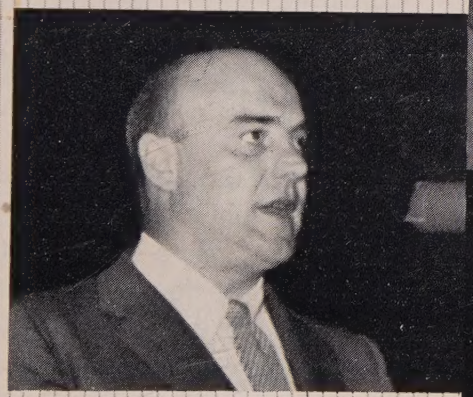
OFFICIAL PUBLICATION OF NATIONAL BUSINESS AIRCRAFT ASSOCIATION

Hon. Louis S. Rothschild,
Under Secretary of Commerce
for Transportation

Capt. Edward V. Rickenbacker
receives the NBAA Meritorious
Award from Henry W. Boggess,
President, NBAA



James H. Straubel,
Executive Director,
Air Force Association

Edward P. Curtis,
Special Assistant for Aviation
Facilities Planning Group
to the President

George H. Halpin, Vice President
Executive Committee,
Minnesota Mining & Mfg. Co.

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DECEMBER, 1956

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The official publication of the National Business Aircraft Association

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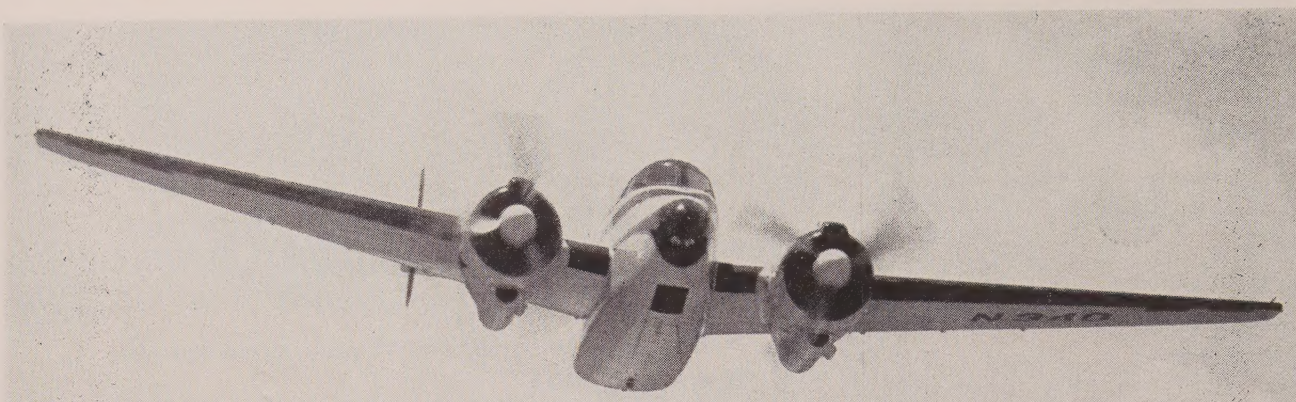

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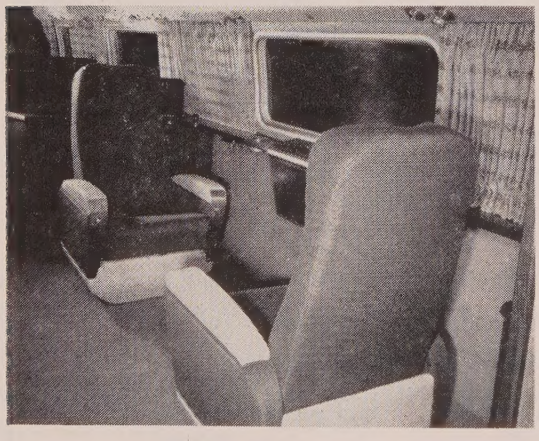

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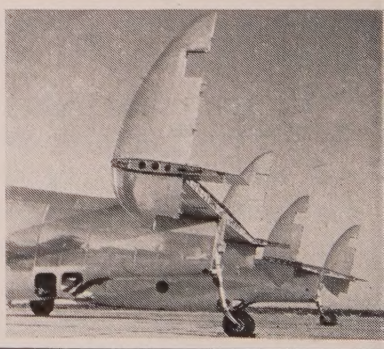

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Rickenbacker Envisions AVIATION in 2006

Twenty-five years ago Captain Rickenbacker foresaw aviation as it is today. Even more dynamic developments are in his vision of the next 50 years of flight.

Edward V. Rickenbacker, Chairman of the Board of Eastern Air Lines, and Honored Guest at the Annual Banquet and Honors Night which concluded the 9th Annual NBAA Forum, has become an almost legendary figure. As a result of correspondence courses in mechanical engineering and drafting, Rickenbacker's early life was devoted to automobiles. When war broke out in 1917 Rickenbacker was in England. He enlisted in the Army, and was later transferred from General Pershing's staff of drivers to the Air Corps. He returned from the war as America's Ace of Aces, credited with 26 victories. He received the Croix de Guerre, Legion of Honor, Distinguished Service Cross, Congressional Medal of Honor and Medal of Merit.

From 1921 to 1926 Rickenbacker served as Vice President and Director of Sales with Rickenbacker Motor Company. In 1927 he became President of Indianapolis Motor Speedway, a position he held until 1945. Having joined General Motors as Assistant Sales Manager of the LaSalle Division in 1928, he was subsequently transferred to General Aviation Manufacturing Corp. as Vice President, Director of Sales.

He joined Aviation Corporation as Vice President of American Airways in 1932. In 1933 he became associated with North American Aviation, Inc., as Vice President, and was appointed General Manager of Eastern Air Lines in 1935. In 1938, North American Aviation having sold their interest, Eastern Air Lines became a separate entity, and Rickenbacker became President and General Manager. In 1953 he became Chairman of the Board.

During the World War II Rickenbacker contacted all Air Corps combat groups in the United States, and undertook special missions for Secretary of War Henry L. Stimson to all principal theaters of war. For these activities he was awarded the Medal of Merit.

Rickenbacker has received degrees in Aeronautical Science, Engineering, Humane Letters, Law and Science from a dozen American colleges and universities, as well as the American Educational Award for 1943 and the Silver Buffalo, highest award of the Boy Scouts of America, in 1944. He is Director of Foremost Dairies, Jacksonville, Fla.; President of Air Force Aid Society, Washington; Member of Advisory Council, Boy Scouts of America; Member, N.A.C.A.; and the author of two books, *Fighting the Flying Circus* and *Seven Came Through.*

In the speech which he delivered upon receiving the National Business Aircraft Association's Meritorious Award for 1956, Edward V. Rickenbacker, Chairman of the Board of Eastern Air Lines, took a long, educated look into the future in terms of the potential development of air transportation.

In order more effectually to draw his comparison between the present and the possibilities of the future, Rickenbacker looked back on the development of Eastern Air Lines, which started with seventeen fabric-covered mail planes and one twelve-place "liner," and which has, during the first six months of 1956, carried more passengers than any other airline in the world.

Rickenbacker anticipates, however, that even this tremendous rate of development will accelerate as the air age progresses into maturity.

"Any attempt to visualize, within fifty per cent of reality what will be accomplished in the next fifty years of aviation would, in the eyes of his friends, qualify one as a fit subject for an insane asylum."

Reviewing the potentials of military development, Rickenbacker foresaw ramjets capable of 2500 and 3000 miles per hour, and nuclear powered guided missiles flying at speeds up to 25,000 miles per hour.

"Transport planes will progressively graduate from today's 'giant' aircraft with speeds of 350 miles an hour to veritable air liners which, by 1960, will be cruising high above the weather with silent, vibrationless comfort, initially in the speed band of sound, or about 600 miles per hour.

"Continuing advances in the development of jet power will move these speeds up to 2500 miles per hour. New York and Miami will then be but 30 minutes apart. You will be able to cross the continent in scarcely more than an hour, span the Atlantic in less than two hours, and cross the Pacific in scarcely four hours.

"The application of atomic power to transport aircraft will bring to reality aviation's inherent potential of being man's most economic, as well as safest, means of travel.

"Because of the infinitesimal weight of atomic engine fuel by comparison with the weight of thousands upon thousands of gallons of gasoline now required for propulsion, the atomic engine will make possible tremendously increased payloads and ranges. This will mean far more efficient aircraft and, consequently, lower and lower cost for the traveling public and the shipper.

"While these atomic powered air liners will link all major cities over the continent and across the world, helicopters will progress from today's reciprocating engines, first to jet powered and then to atomic propulsion, increasing in size and carrying from fifty to 100 passengers, and in speed to the swiftness of our present transport aircraft."

Rickenbacker even contemplated the possibility of space transportation "in the span of this next half-century of aviation," envisioning ships carrying up to 2000 passengers at 5000 miles per hour, and almost as self-sustaining as planets.

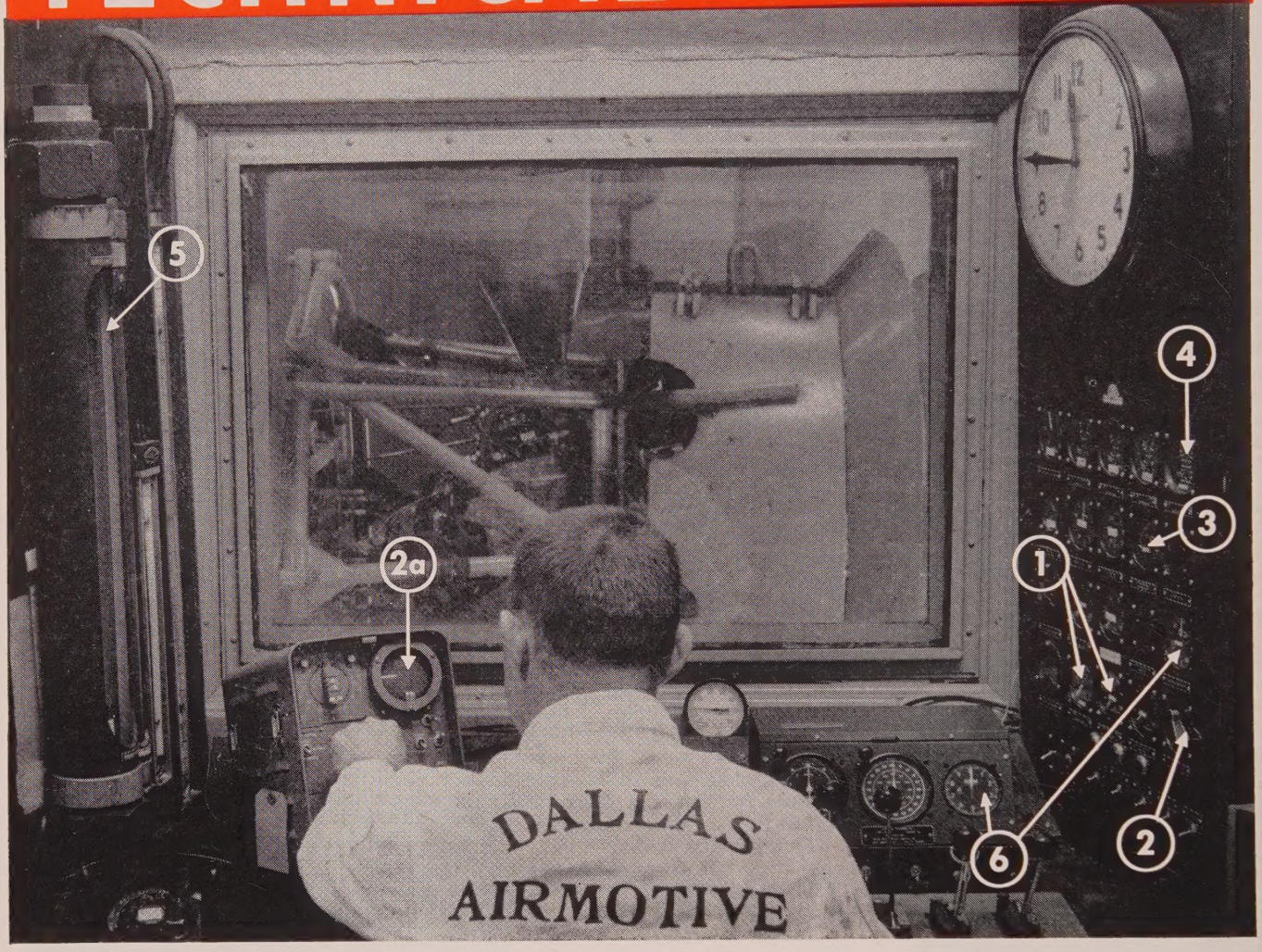
Rickenbacker characterized some of the moral implications of the age of air development, observing that "with aviation's development in the hands of men of good will we have, for the first time in the long history of man, the one instrument which can forever eliminate the barriers of time and distance, of ignorance and misunderstanding, which since time began, have set men apart from, and against, one another.

"In terms of human relationships, these advances in aviation mean that the world will grow progressively smaller.

"Then people of all nationalities will have, within their own hands, the means of meeting and understanding all people, and for eliminating the petty hates and jealousies which breed wars.

"For, in the years ahead, every community on the face of the earth will be a port of entry and departure for every other city, town and hamlet on the vast ocean of air, on whose shores every man lives."

TECHNICAL TESTING



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2. Magneto Check?
2a. Ignition System Condition?
3. Head Temperature?
4. Oil Temperature?
5. Fuel Consumption?
6. RPM vs. MAP?

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PERSONNEL

Dr. Leslie L. Thomason has been named Director of Air Age Education for Cessna Aircraft Co. Dr. Thomason, former Dean of Northwestern State College, Alva, Okla., will devote most of his time to addressing business and civic groups on the air age and the use of aircraft in business.

Guy Miller has been appointed manager of Cessna Aircraft Co.'s Model 620 Sales Dept. Miller has 22 years' experience in the sale of aircraft to corporations. **E. W. Keplinger** has joined Cessna as Regional Sales Manager. **C. W. (Bill) Cole** has been named Cessna Regional Sales Manager for Central America and Caribbean area.

Thomas F. Grieser has been appointed General Works Manager, in charge of manufacturing of electronic and aircraft equipment, of Air Associates Mfg. Div.

Dr. Raymond H. DuHamel is new head of the Research and Development Antenna Group at Collins Radio Co. He worked previously at the Antenna Laboratory of the University of Illinois.

Eugene Planchak has been appointed Dayton Sales Representative for Bendix Pacific Div.

G. R. Dutton has been appointed Plant Manager in an executive reorganization by L. B. Smith Aircraft Corp. **Ralph W. Nesmith, Jr.,** is new Aircraft Sales Manager. **Joseph M. Bruce** was named Aero Commander Sales Representative for southern region. **F. (Barney) Oldfield** has been named Chief Pilot, in charge of all flight operations.

William M. Myers has been named Manager of the Atlanta, Ga., branch of Air Associates, Inc.

John B. Cowen has been appointed Assistant to the Vice President, Manufacturing, of Aerojet-General Corp., Azusa, Cal. Cowen was previously Director of Govt. Operations for General Tire & Rubber.

Allan B. Heinsohn, formerly with NPA, has joined the Sales Department of Safe Flight Instrument Corp.

Harry S. Baer, Jr., has been elected Secretary Treasurer of Aeronautical Training Society, succeeding the late Wayne M. Weishaar.

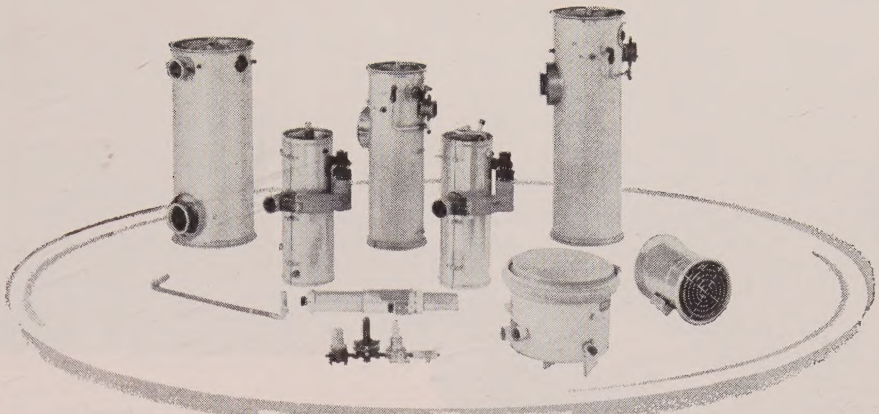
Eugene D. Stafford, Chief Pilot of Goodyear Aircraft Corp.'s heavier-than-air fleet has been appointed Chief of Flight Operations at the Litchfield Park, Ariz., plant.

Gen. K. B. Wolfe (USAF Ret.) was appointed Assistant to the Chairman of the Board of The Garrett Corp.

COMPANIES

Radio Div. of Bendix Aviation Corp. has announced the opening of an Advanced Engineering Center in Baltimore, for technical projects on radar and communications.

Allied Instrument Mfg. Corp., Houston, has announced the change of the corporate name to **Aviation Instrument Mfg. Corp.**



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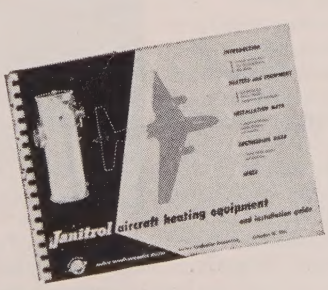

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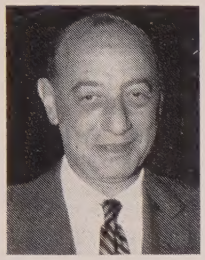
Photo at far left shows a typical conference scene as an airlines representative takes the microphone to ask a question. At right, Richard Teasel, Champion's Director of Research (*with microphone*) speaks for Champion.

Champion's R. K. Christie (*left*), Vice President for Engineering and Research, and Larry Lentz (*center*), discuss series of special reports that noted aviation expert and writer Herbert O. Fisher (*right*) will do for the Champion Spark Plug Co.

87 different organizations from nine nations were represented at the three-day conference, the twelfth annual ignition meeting sponsored by Champion.

Business Aviation and GOVERNMENT PROGRAMMING



The Honorable Louis S. Rothschild, Under Secretary of Commerce for Transportation since 1955, has a long career of civic and government service. Prior to his present appointment, he was Chairman of the Federal Maritime Board and Administrator of the Maritime Administration, before that was Chairman of the Board of the Inland Waterways Corp. As Maritime Administrator he initiated a $400,000,000 ship building program and undertook improvements in the national defense reserve fleet and experiments in merchant ships and propelling machinery.

As Under Secretary of Commerce he has also been named Chairman of the Air Coordinating Committee, a Member of the Committee on Government Security, and a Member of the National Advisory Committee for Aeronautics.

Mr. Rothschild, who was graduated from Yale in 1920 with a PhB, is president of Rothschild and Sons, Inc., a retail business founded by his grandfather in 1855, and director of the Central Surity and Insurance Group. He is Chairman of the Kansas City, Mo., City Planning Commission, a Vice President of the Menorah Medical Center, Vice Chairman and Director of the Midwest Research Center and past Vice President of the Chamber of Commerce. Mr. Rothschild served in the Navy during World War I.

Text of the address by Hon. Louis S. Rothschild, Under Secretary of Commerce for Transportation, to the NBAA, October 24, 1956.

"It gives me great pleasure to talk to the group which represents the fastest growing segment of our fastest growing form of transportation.

"Dedicated as we are in the Department of Commerce to a dynamic, expanding economy, it is particularly satisfying to note how alert business and businessmen have been to seize the opportunities offered by the airplane. The tempo and volume of commerce are being accelerated beyond measure by use of the airplane as a business tool. Anticipated developments in aircraft design plus a number of quite favorable long-range trends in the American economy all point to even further healthy expansion in business air transportation.

"Some idea of the role it is playing can be gained from the fact that last year business flying totaled approximately 4.3 million hours, substantially more than the hours logged by the airlines of the United States. The 1955 activity was up an estimated 11 per cent over 1954, and there is no sign of a slackening in this vigorous growth.

"Among the long range trends favorable to business flying growth are continued industrial dispersion with plants located at off-airways sites, the general optimism of businessmen generated by the continuation of high profit levels, sectional competition, and the realization by companies and corporations that they can keep travel time of high-salaried executives at a minimum by air travel. The convenience and flexibility of travel permitted by company-owned planes are other attractive features which contrast favorably with the infrequent schedules available from many smaller cities by either surface or air common carriers. There is also the element of prestige attached to aircraft ownership as tangible evidence that a firm is receptive to the most modern and up-to-date ideas in company transportation.

"These gains were achieved almost entirely through the initiative of business itself, which is as it should be. As Abraham Lincoln said, 'The legitimate object of government is to do for a community of people whatever they need to have done, but cannot do at all, or cannot do so well for themselves, in their separate and individual capacities.' The words of Lincoln just quoted are repeated in this Administration's Declaration of Faith.

"There are, of course, quite a few areas in which your government has been happy to provide services for business flying. These services, in the fields of airways and airports, have been as vital to business flying as they have been to military, air carrier, or personal aircraft operations.

"I want to tell you something of our plans to make these services even more valuable to all who fly. But first I want to speak briefly about the situation of joint civil/military use of airports. There are two aspects to joint civil/military use. On the one hand, we have airports controlled by the military, where the business flyer may need to land. On the other, we have civil airports, where a military need develops, as for example a reserve unit.

"In the first case, it is possible for the business flyer to make arrangements to use a military field. If I understand the military regulations, they require the would-be civil user to show: (1) that the proposed operation does not jeopardize military interest; (2) there is no expense to the government involved; (3) that the civil flyer is heavily insured to cover any damage to government property; (4) that he will agree to "hold harmless" the Federal Government for any damage that he suffers; and, (5) that there are no civil aviation facilities available. Such regulations, while possibly necessary, seem to result in an unnecessarily cumbersome procedure, and permits, I am told, often take ten to thirty days in clearing through channels.

"I would urge the military to accept the visiting company aircraft, which is almost assuredly on defense business, as a routine operation, and to work out both permanent type clearances, and quickly obtainable special clearances, where these are not already easily available. I feel that when people of good faith sit down with one another, both with reasonable points of view, a compromise can be worked out which will serve the interests of all concerned.

"We did exactly that in arriving at the VORTAC program, and in airport use it seems to me the potential areas of conflict are far narrower.

"Meanwhile, there is something you can do for yourselves about the other aspect of joint use. The military requirements for operations at civil airports keep growing, and almost every day some community is approached on a joint-use agreement. In many instances, the community may be one where you have to land or take off in the course of your business flying.

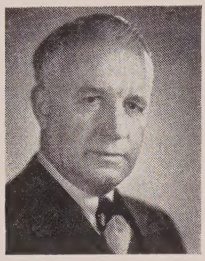
"Where this is the case, you have every right to and should express to the city fathers your concern that the agreement protect the interests of civil users. The Civil Aeronautics Administration is always available for consultation on how such agreements can be drawn so that all valid civil and military needs are met. It should be remembered, however, that CAA doesn't always come into the picture automatically, nor does it have unlimited powers when it does enter the scene. You, as important citizens of your communities, must make your views known and then follow through.

"I have mentioned VORTAC, and want to say more on this subject because it is an important element in our broad program of better airways for business flying and all flying.

"As you all are well aware, the Air Coordinating Committee arrived at an agreement on August 30, 1956, on a national program for proceeding with a common rho theta short distance navigational system known as VORTAC. This agreement, on the part of the Air Coordinating Committee, was preceded by months of intensive work in which NBAA participated along with the other industry associations and government agencies, and I might say were most helpful. I do not need to tell you here that the NBAA's original position was not exactly in accord with the decision which was finally reached. Your representatives were most effective in pointing out all aspects of the NBAA requirements and beliefs. It was, therefore, most gratifying to me that irrespective of our differences that your

(Continued on page 34)

Patterns for Progress in Traffic Control



Edward P. Curtis, Special Assistant for Aviation Facilities Planning Group to the President, a Vice President of the Eastman Kodak Co., and Distinguished Speaker at the presentation of the Business Flight Safety Trophy by the Women's Aeronautical Association of Kansas, was active in aviation during both wars, serving during World War I with the 95th Aero Squadron as combat pilot, officially credited for six German planes destroyed. After the Armistice he served on General William Mitchell's staff, and subsequently as secretary to the U.S. Commissioner to the Baltic provinces of Russia.

During World War II he served as Assistant Executive to General Spaatz, USAF, having been commissioned to the rank of Major in 1940. He also served as one of the Secretaries of the Air Staff until arrival in England in 1942 as Deputy Chief of Staff of the 8th Air Force. Curtis served on the Staff of General Spaatz in the North African invasion, and became Chief of Staff when General Spaatz was commanding the North West Africa Air Force. Curtis remained in that capacity through the Italian invasion, returning to England in 1944 as Chief of Staff of the US Strategic Air Force in Europe. He retained that position until the end of hostilities in Europe, being promoted to the rank of Major General in 1945. His military decorations include the Distinguished Service Cross, Distinguished Service Medal, Legion of Merit, Legion of Honor, Croix de Guerre, Silver Star and Bronze Star.

Excepting the period between December 1940 and October 1945, during which time he served with General Spaatz, Mr. Curtis' entire business career has been with the Eastman Kodak Company, where he started in 1920. On his return in 1945 Mr. Curtis was elected Vice President in charge of international supervision of motion picture film business.

"We are controlling our airways with a system largely designed in the DC-3 era, with an overload of communications network, and in many cases, inadequate airports. It is a tribute to the devoted efforts of C.A.A. personnel, and to the skill of our civil and military pilots, that the system has worked as well as it has."

Addressing the Ninth Annual Forum of the National Business Aircraft Association, Edward P. Curtis, Special Assistant to the President for Aviation Facilities Planning, went on to say that most improvement to bring all existing facilities up to date are embodied in the Civil Aeronautics Administration's five year plan. Planned improvements include increased airport and long range radar coverage, improved communications, and better approach and lighting systems, according to Curtis. Contemplating the future, he said, "Our longer range objective, however, includes many problems of which adequate traffic control is only one. We need an overall plan for a national airport system which will give present and future airport operators some guidance in the type of facilities which should be provided, including runway lengths, high speed turnoffs, and the like. We will need some estimates of the costs of these and other facilities and to determine as far as possible an equitable distribution of these costs between Federal, State and Municipal agencies, and the users of these facilities."

Curtis further advocated some form of organization on the national level with authority to implement any reasonable, generally accepted plan, meeting with the approval of Congress and the various air interests. The speaker contended that the current scientific research undertaken by Airborne Instruments Laboratory, Aeronautical Research Foundation, and the Cornell Aeronautical Laboratory, was still preliminary probing, and was subject to much review. Curtis was optimistic enough to say that definite patterns for progress are beginning to emerge.

Curtis foresees a tremendous increase in passenger miles flown by the airlines, and a decrease in the number of manned military aircraft as the new types of missiles are perfected. He placed a question mark on the future of air cargo flying, the helicopter, and the short-take-off type of aircraft, saying that all related factors had not been determined well enough to form an accurate evaluation at this time.

Referring to the direct efforts of the NBAA, the speaker said, "We are very much interested in the work of the general aviation facilities planning groups in which your organization is participating. We have every expectation that together we will be able to build up a far more accurate projection of the activities in this field than has ever been available before. I would urge that you continue to give special support to this part of your effort."

Since air facilities are determined by the number, type and performance of tomorrow's airplanes, Curtis said that the Cornell Laboratory is devoting its skills to this study.

In the interest of practicability, the speaker urged that manufacturers consider 10,000-foot runways as the maximum demand for future requirements.

"The recent performance of the experimental X-2 at 2100 miles per hour is a dramatic example of what we can expect in the future. Civilian developments usually follow military ones, but for economic reasons it is doubtful that airliners in a supersonic speed range will be profitable in the twenty-year period we are looking at."

The presidential assistant said that one of the cornerstones of an air facilities plan is the development of an air traffic control system capable of phasing in with the system we now have, but at the same time, flexible enough to meet growing requirements. "I am referring tonight to air traffic control in its broadest sense to include the most efficient use of our air space, an adequate control, and the communications which link all of these items together." Theorizing that the ideal system would be one which permitted any pilot to fly anywhere he wanted to at any time regardless of weather conditions, Curtis was quick to caution that this ideal did not appear in his crystal ball in the foreseeable future. Detriments to this ideal are speed of aircraft, wide diversions to the amount and quality of airborne equipment, and the great spread in the degree of pilot proficiency. Emphasizing his point with a hypothetical example, Curtis said, "It would be quite unreasonable to expect that a pilot with twenty hours of solo time and no radio should be permitted in a congested traffic pattern in a major airport." He added, "If he had any sense he wouldn't want to be there anyhow."

After noting that there are a number of different possible ways of approaching the traffic control job, the first decision becomes one of selection. Curtis pointed out that one of the reasons it is so difficult to develop a comprehensive plan for the efficient and economical use of our national air facilities is the great diversity of interest among the users of these facilities: the military, the commercial airlines, and business aviation. "All of these aircraft have different reasons for being in the air, but all of them are rightfully entitled to share the air space and the air facilities provided in it."

Summarizing, the speaker said that probably no system can ever be devised which will be entirely satisfactory to everybody, and that there will have to be some compromise between the ideal and what is feasible in practice.

"The growth of aviation in recent years, particularly, has suffered badly from the lack of a long range program, so that we can well afford to spend some time on its preparation now, provided we get action on it when it is completed. With the continued cooperation and support we are getting from all concerned, I am confident that the nation's air facilities can be developed to meet the increasing demands we all know we are facing."

What the JET AGE Means to BUSINESS AVIATION

James H. Straubel. Editor and Publisher of Air Force Magazine, Executive Director of the Air Force Association, and Distinguished Speaker at the Presentation of NBAA Annual Pilot Safety Awards to Member First Pilots at the 9th Annual Forum, began his career in journalism as reporter and feature writer for three Wisconsin newspapers. He was Managing Editor of American Aviation Magazine when called into military service as Second Lieutenant (Reserve) in 1941 with the Army Air Force. Shortly thereafter he was assigned the job of establishing Air Force Magazine as the official service journal of the Army Air Forces.

Mr. Straubel served as Editor and Publisher of Air Force Magazine throughout the war. It was distributed to all units of the Air Force throughout the world, and reached a monthly circulation of 600,000. In 1945 he established a Far East edition of the magazine, which was published in the Philippines. He was awarded the Legion of Merit by General H. H. Arnold, Commanding General, USAAF.

After separation from military service as Colonel (USAFR) in 1946, Mr. Straubel became Associate Publisher of Avon Publishing Co., New York. He joined the National Headquarters Staff of the Air Force Association in 1947 as editor of its official journal, Air Force Magazine, successor to the magazine he established during the war. He was appointed Executive Director of the Association in 1948.

Mr. Straubel has edited two books, *Official Guide to the Army Air Forces*, 1944, and *Air Force Diary*, 1947.

In his address at the Ninth Annual Forum of the National Business Aircraft Association, James H. Straubel, Executive Director of the Air Force Association, surveyed the imminence and the characteristic problems of the jet age in American business aviation.

Noting that speed is increasingly a factor of great importance, Straubel envisioned the jet age as an economic necessity, both to the civil and the "military executive," a concept which he deemed essential to national defense, and to which the manufacturers of business aircraft are making more and more significant contributions. Although the jet age will not come without its problems, Mr. Straubel pointed to the Air Force as an example of a successful and facile conversion to jet operation, and emphasized the value of the accumulated knowledge which Air Force jet experience provides for civil operators. Mr. Straubel assured his audience of the inevitable success of the American jet age in business aviation, spurred by the recent advances made in Russian jet transportation.

In describing the importance of speed to business aviation, Mr. Straubel quoted remarks made by the Chairman of the Board of Continental Can Co., in announcing an order for three Fairchild executive jets:

" 'High salaried executives,' " he said, " 'have a corporate worth many times greater than their salaries. Their time is worth thousands of dollars per hour. The speed of an airplane can contribute immeasurably to the best utilization of an executive's time.' "

Mr. Straubel observed that "The aircraft available to the modern executive —when measured against the requirement—are deficient in a number of characteristics." Among the modern executives who require this speedy transportation, Mr. Straubel notes that the present state of continuous preparedness makes the military man more consistently valuable than at any time in the past. "If our defense posture is to be maintained indefinitely," Mr. Straubel said, "it is high time we accepted the military leader into our executive ranks. The point is that both of these executive groups continue to fly from point to point in vehicles which are obsolete in terms of the times."

The result of the military requirement for planes that very closely approximate the requirements of civilian executives has created a large demand for the products of business aircraft manufacturers, and this demand creates a very advantageous situation for the business market.

"Never before, to my knowledge," Mr. Straubel said, "has the military deliberately planned the purchase of aircraft with civilian requirements in mind—and more than that, with the expressed willingness to waive, if necessary, any specific military requirement to achieve CAA certification.

"One aircraft manufacturer has estimated that if he placed an executive jet on the commercial market, a four engine job with eight or nine passengers and a crew of two, without the minimum Air Force requirement in prospect, sales price would be between $750,000 and $850,000, complete. On the other hand, if the Air Force purchased 300 of these multi-jet transports, as programmed, he could offer them for sale to the business fleet at about $500,000 each, complete."

Mr. Straubel mentioned some of the problems which characterize the jet age: engine maintenance, fuel system management, communications and traffic, the noise problem, and the physiological effects of high altitudes. Quoting a statement on jet age problems made by a CAA official, Mr. Straubel added that:

" 'We have become immediately aware that the jet problem is not a problem as such, but rather a need for correction of troubles common to conventional aircraft operations, which are intensified by the greater speed, higher altitude, and faster fuel consumption of jet aircraft.' "

The solution of many jet age problems, Mr. Straubel said, will probably come from Air Force experience.

"It is obvious that the Air Force has transitioned from piston engines to jets with far less headaches than were contemplated at the beginning . . . For sheer dependability, as well as speed and comfort, Air Force pilots swear by their jets. And the pioneering has been done. The Air Force has built up a vast store of jet knowledge which business aviation will have at its disposal. This is a plus factor of major importance."

Observing in conclusion that regularly scheduled jet transport operations in the Soviet Union are at least two years in advance of scheduled jet transport operations in the U.S., Mr. Straubel sees in this development "a challenge we can't ignore. Our businessmen have taken the American Flag across the world by surface transportation—and by piston-engined aircraft. I'm sure they will carry the Flag with equal glory in the Jet Age."

The January issue of

SKYWAYS

will cover the following

NBAA Panels:

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Discussion of Engines

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Needs of the BUSINESS PILOT

Text of the speech delivered by Ralph Piper, Chief Pilot, Monsanto Chemical Company, at the NATA meeting, St. Louis.

"I have been asked to recite the needs of the business pilot. I would like to explain that I am not necessarily appearing before you representing Monsanto. I am speaking rather for the business pilot in the National Business Aircraft Association.

"It is certainly a real privilege to be able to meet with so many members of your segment of the industry and I only hope that from this meeting can come a better understanding of our problems. First let us decide just what a business pilot is. I am quoting now from a pamphlet published by the Associated Aviation Underwriters who say this about the executive pilot:

" 'An executive pilot runs a one-man airline. He is his own meteorologist, aeronautical engineer, hydraulic engineer, electronics expert, dispatcher, navigator and superintendent of maintenance.

" 'He is a man of many decisions. His decisions involve his own life, the lives of his passengers and many millions of dollars. He makes these decisions at 200 miles per hour with a 300 mile per hour brain. He makes them without the help of a Board of Directors. He has to be right every time.

" 'He has to be a diplomat and a salesman because he must fly the passengers as well as the airplane. He is the only man on the payroll who can overrule the Chairman of the Board. In flight he IS the Chairman of the Board.

" 'All this vast technical knowledge and skill and diplomatic ability are useless unless he has common sense or good judgement, or whatever you want to call it. We call this ability to think straight in an emergency the 'X' factor. It is what keeps him alive. It is the difference between a long gray beard and a long gray tombstone.

" 'Pilots who have all these qualities are the most highly trained professional men in the history of the human race. Never before have mortal men shouldered such tremendous responsibilities.'

"Now, I don't know any pilot who fits that description exactly.

"Somewhat more than ten years ago I was faced with a problem, a pleasant one, I might add, but it had to do with setting up a system and a policy of operation for my company. This system, of necessity, would have to work regardless of whether we were operating one or several airplanes. I was in Wichita at the time, waiting for delivery of a new twin Beechcraft which I was to fly back to St. Louis in order to start the operation of an executive aircraft for executives. I had had no experience prior to this in setting up an executive operation, nor did I have access to volumes of books to tell me what to do. I had the advantage of knowing my company, knowing the men whom I was to fly, and this helped. I had been in their offices. I had observed how their offices were furnished and how the services of other office personnel were carried out, and I knew what they wanted in the way of service on the airplane. But, of course, there were pilot selection, training, upgrading, periodic proficiency checks to think about. There was a maintenance system to be selected and regulations to be written to see that maintenance was accomplished in a proper manner. There were hundreds of items considered during those days of waiting in Wichita. We finally came up with our Standard Operation Procedures in booklet form and since then all we have had to do is to make a few slight adjustments to accommodate the ever-changing needs that are inevitable. I imagine almost every company has had a similar beginning in the operation of its aircraft. Every company's needs are just a little bit different. Their systems of operation naturally will be different. You, who are in the industry, realize that as you deal with these various companies. There are, however, two main items in any operation which concern not only the company but you people as well. Those are the things we will discuss today. They are service and maintenance.

"First, we will discuss service. I believe in first impressions and that first impression is improved by repeated performance. That is, if a warm greeting comes from your line chief as we open the door and he offers a long line of services for our use, I am impressed, so much so that I am even willing and happy to pay for them. I would like to give a good example of poor service and what happens. Several months ago, I landed at an airport in the hills of eastern Tennessee at 10:15 at night. I had never been on the airport before. After landing, the tower operator became very busy with other aircraft movements so I received no help from the tower for direction to the parking area. But in the dark, I finally made out another aircraft and decided to park alongside it. As it is against my policy to leave parking brakes on over night, I went about searching for wheel chocks in the dark and my search took me near the hangar where I saw a light in the room that looked like the office. There I saw a man sitting at the desk apparently with nothing else to do but sit. So I asked him if he were connected with the service on the field and he said he was. I asked him if he sold gasoline and he said that he did. I asked him if he knew where there were any chocks to park the airplane and he said no. I asked him if he heard me taxi up and park and he said yes. I asked him if he wanted to sell some gasoline and he said yes, but he really went off duty at 10:00. It was then 10:20. My answer was 'I need 500 gallons of gas but I am not going to buy any here.' I then proceeded to find some blocks and parked the airplane and left for the night. I couldn't help but think about the operator who owned the fueling service and what a dirty trick this employe was playing upon him. So the next morning, after arriving on the field, I decided to find the manager and ask him if he knew what was going on when he thought he had left his business in good hands. Believe it or not, he appreciated my telling him what had happened the night before and, of course, the only explanation was 'it's hard to get good help now-a-days.' That sort of thing perhaps happens every night almost anywhere in the United States. But believe me, as a business pilot, who buys many thousands of gallons of gasoline a year, any one of us can adjust our loads and points of purchasing fuel so that people who give good service get the business.

"Anyone who drives into a filling station and buys anywhere from two to 20 gallons of gasoline automatically gets his windshield washed, his head lamps wiped off, the rear window cleaned, tail lights cleaned, and, many times, ash trays dumped. I am prepared to give each one of you here a silver dollar for the number of times I have had the windshield of my airplane washed in the past two years without asking for it, excluding our home base. Of course, it is a great deal more difficult to wash the windshield of a DC-3, 15 feet off the ground, than it is to lean down and wash the windshield of a modern car. There is considerable difference between purchasing 10 to 15 gallons of gas and buying between 400 and 700 gallons of aviation fuel. I am sure there is a reasonable profit in the sale of 400 to 700 gallons of gas or you wouldn't be in business at all. I believe the reason for our not getting this service automatically is because there aren't as many of you people in the business as there are filling stations in the business. You don't have enough competition.

"The business aircraft industry is not a budding infant even though it has grown quietly and its growth is unheralded.

"According to the CAA figures, there are 60,000 active civilian aircraft. They flew an estimated 9½ million hours in 1955. This fleet outnumbers the airline fleet of 1500 aircraft 40 times. The hours flown were three times more than those flown by the airlines. Business flying alone flew 4,300,000 hours, a million more hours than did the air-

(Continued on page 37)

Halpin: 3M Business Flight Operations

Text of the address by George H. Halpin, Vice Chairman, Executive Committee, Minnesota Mining & Mfg. Co., at the presentation of the NBAA Meritorious Award, October 25.

"AFTER all that has been said and so thoroughly discussed in the outstanding panel meetings of the past few days, I have a distinct feeling of inadequacy in presuming to add anything of value to the challenge of business flying. Unfortunately too I cannot speak with any authority or experience in the operation of the preponderantly larger number of single engine ships which are being flown today for business purposes, but when I look back to those days when as a salesman I was traveling this whole southern territory from Memphis to New Orleans and Knoxville to Jacksonville, I look with envy on the younger business men of today flying their own ships in similar territories, for I am certain that with this modern business tool, I could have greatly increased my own efficiency and earning power. Consider therefore that what I say here will be confined to our experience with multi engine ships. Specifically we have three DC-3's, one Lodestar and additionally one Cessna 310, the latter on an experimental basis.

"Our company operations are organized on a vertical basis and by that I mean we have twenty-four separate divisions of our business, each division having a general manager responsible for all operations of the division. These twenty-four division general managers are responsible to seven group vice presidents who in turn are responsible to our president as chief executive officer.

"In addition we have eight staff officers serving our divisions on such functions as personnel and industrial relations, corporation counsel, public relations, finance, engineering, research, purchasing, and director of sales. Over and above these offices, we have a chairman of the board, a chairman and vice chairman of our executive committee and our president. These seven group vice presidents and eight staff officers and the four in the top group—nineteen in all—are entitled to requisition our airplanes.

"So you see we have quite a scheduling problem. The scheduling operation heads up to our aviation office which is under the direction of our chief pilot, Don Richardson. Additionally, he is responsible for all of our airplane operations, including our pilots, co-pilots, maintenance, overhaul and procurement—a staff in all of approximately fifteen people. Thus you see we make a real business of operating our business aircraft in the most efficient and economical manner.

"Looking backward, I ofttimes wonder how we ever got along without this modern convenience. With our twenty-five plants and seventeen branch houses in the United States, our overall efficiency has been greatly improved through our ability to quickly reach any plant or office from coast to coast. While many of our plants and offices are on the main line of the airways, a number would require several air line changes and consequent delays in getting there, but over and above this is the stepped up efficiency of what we call the psychological factor and that is the encouragement to go at once and get the job done and get back in probably less than half the time it would take through any other mode of transportation. We all know the human tendency to want to put off to tomorrow the things which should be done today. I am sure our business aircraft has greatly remedied this tendency.

"Apart from the operations side of our business, I want to speak of the business aircraft as a sales tool. Time after time and continually we are demonstrating what great value this has for us. Our sales people are continually pounding away at the facilities we have in manufacturing, research and development to serve the trade we sell. So are all the sales people of our competitors, so, in a large sense, the customer or prospect rates us as just another supplier. But when we can say to an important customer or prospect or a group of customers and prospects in one locality that we want you to gather your own group of people who decide and come to our plant and talk with the many people you should know and see and better understand the facilities we have to serve you, for which we are ready to call for and deliver you back home promptly in our airplane, it is amazing how many customers and prospects we have been able to influence by this method, and we can trace a substantial volume of business we have been able to annex through this method.

"Again, on sales meetings in our branches where we have new programs on new products or reviver programs on old products, we can send a group of our sales and advertising and merchandising people with their exhibits and charts and sales paraphernalia directly to our branches and in such meetings as I have described, we have been able to cover as many as five branches a week that may be a thousand miles apart—all through the use of our business aircraft. While it is impossible to put a dollar sign on all these things I have been talking about, we, as management people, are convinced that our aircraft are a real asset to our business and are by and large an economical business tool in spite of the cost.

"And now on this subject of cost, there is no doubt that in this comparatively early stage of business aircraft development that the operation of the two engine planes currently available for executive use, such as our recon verted DC-3's and Lodestar, are expen sive to operate, but against this mult engine aircraft are the safest aircraf to fly and this is a tremendous facto in the lives and well being of executiv personnel who fly in these ships.

"Continually we are seeing the grea development which is taking place i the refining of multi engine aircraft t meet the economical needs and stil maintain the safety factor of busines flying. Gradually, I would expect th DC-3's executive ships to be confine to the longer runs exceeding 500 mile and the smaller but not too small nev models in use for the runs of less than say, 500 miles where one pilot unde sound visual flight conditions would b able to maintain the necessary spee and safety factors.

"With such planes and an averag passenger load of three, I can visualiz a cost well within the cost range o commercial airline travel. To this en we are now experimenting with a Cessn 310, which I mentioned earlier.

"There has evidently been some re luctance on the part of many to tel what it costs to operate the DC-3's an Lodestars because nowhere in the litera ture on the operating of these types o business aircraft have I seen practicall any reference to operating costs. Mayb this is like the story about one of ou wealthy men who had a fine yacht t sell where the prospective purchase asked him about the cost of operatin and he replied, 'If the cost of operatin is of any concern to you, I advise yo not to buy this yacht.' Or maybe it i because some stockholder might becom critical if he knew the cost, but regard less I will tell you what our cost is.

"Our average indirect expense fo our DC-3, and this includes pay rol insurance, licenses, taxes and depreci tion, is $3,500.00 per month, and ou direct expense, which includes gas an oil, repair and maintenance, landin and hangar, telephone and telegraph pilots' expense, commissary and inci dental expense, amounts to $6,500.0 per month, or a total cost of $10,000.0 per month. This cost is based on a average of fifty flight hours per mont and 9,000 flight miles per month. W see very little difference in the cost o our Lodestar vs our DC-3.

"While the present cost of busines flying is comparatively high, I envisag with the current development of ai craft designed specifically for busines use that this cost will be materiall reduced. Moreover ever present cos begin to look small when measure against the time saved and the conve ience and the freedom from wear an tear which the business airplane give to those who fly.

"There is no doubt in my mind as t the future of business flying—my onl doubt is that with the tremendous i crease I visualize in this kind of flyin that the airways are broad enough an high enough to take care of the a space requirements of the coming year but I am willing to leave this to th experts who are now working hard t solve this problem for the future."

administration

Annual Membership Business Meeting

McAllister Hotel, Tuesday, October 23 Panel Chairman: Henry W. Boggess, Sinclair Refining Co. Panel Members: Cole Morrow, J. I. Case Co.; Curt Talbot, General Electric; Ralph Piper, Monsanto Chemical Co.; Walter C. Pague, ARMCO Steel Corp.; Gerald Eger, International Harvester; Joseph B. Burns, Fuller Brush Co.; William K. Lawton, Executive Director and Secretary, NBAA.

AN *informal photo of part of the Annual Membership Business Meeting Panel. Left to right, Cole Morrow, Curt Talbot, Ralph Piper and Walt Pague.*

Henry W. Boggess *(Chairman):* "It is very nice to have you down here at the beginning of National Business Aircraft Association's Ninth Annual Forum. We are going to go through the business of the Association in proper order and as rapidly as we can.

"First of all, I would like to introduce the directors and officers of your Association who are with me at the speakers' table. I am sure that those gentlemen do not need introduction, but perhaps you do not get to see them very often.

"Cole Morrow, past president, chairman of the nominating committee, chairman of the Board of Directors.

"Mr. Curt Talbot of General Electric, member of the Board of Directors, Chairman of the technical committee.

"A professional pilot, Mr. Ralph Piper of Monsanto Chemical Company, St. Louis, member of the Board of Directors.

"Another professional pilot, an old timer in N.B.A.A., long a member of the Board of Directors, Walt Pague from Ohio. Some of you gentlemen may not, until now, have had the privilege of meeting our new Executive Director and Secretary, who is a native of these parts, Bill Lawton.

"And your treasurer from International Harvester, Gerry Eger.

"And as every association must have, we have a disciple of Blackstone, Mr. Burns from Fuller Brush.

"In view of the actual and the projected increase in the size and in the stature of your Association, the Board of Directors in their meeting held on June 7, 1956, adopted a resolution recommending to the members of the Association an increase in the number of directors from nine to eleven in order to provide means to obtain Board members representing a larger cross section of business aircraft users.

"Accordingly, it is proposed that Section 1 of Article IV of the by-laws of the National Business Aircraft Association be amended to read—and I quote Section 1:

"'Number and Qualifications of Directors. The Board of Directors of the Association shall consist of not more than eleven members. Only officers and employees of regular members shall be eligible for election as Directors and at no time shall the Board of Directors consist of less than six business representatives of regular members or more than five pilot representatives employed as pilots of regular members.'

"Further, the Board of Directors at their meeting held on the same date, on June 7, 1956, adopted a resolution recommending to you, the members, that an amendment to Section 2 of Article IV of the by-laws, be made to provide that the eleven Directors shall be elected in three classes, each class to hold office for three years in the following sequence: three Directors the first year, and four Directors the second and third years. Accordingly, it is being proposed that Section 2 of Article IV be amended to read as follows—and I quote:

"'Section 2' entitled Staggered terms. Beginning with the 1956 annual meeting of the Association of members, the Board of Directors shall be elected for a term of three years each, in the following sequence: three members the first year and four members the second and third year.'

"The Board of Directors at their meeting held on August 9, 1956, also adopted a resolution recommending to you, the membership, an amendment to Section 2 of Article II of the by-laws to broaden the eligibility for membership as associate members to include all those interested in the aviation or the air transportation field, instead of those primarily engaged in the aviation or air transportation field. Accordingly, it is proposed that Section 2 of Article II of the by-laws of the N.B.A.A. be amended to read as follows—and again I quote:

"'Section 2.' entitled, 'Associate Members.' 'Any corporation, company, partnership, institution or individual interested in the aviation or the air transportation field is eligible for membership as an associate member, subject also to the approval of the Board of Directors. An associate member may be heard at any meeting of the Association on any matter pertaining to aviation and within the scope of the Association's activities, but shall not vote or be deemed part of a quorum at any meeting of the Association. An associate member may designate in writing one of its officers or employees to represent it at meetings of the Association and may from time to time, in the absence of such designee, designate in writing an alternate officer or employee to represent it at the meetings of the Association.'

"I would like to move that Sections 1 and 2 of Article IV and that Section 2 of Article II of the by-laws of the National Business Aircraft Association be amended to read as I have just stated.

"May I have a second to that motion?"

Member of the Audience: "I second it."

Boggess: "Then it is regularly moved and seconded that the various amendments I have read and as published and as mailed to all members be adopted.

(Continued on page 20)

"Is there any discussion with respect to the nominations for the candidates for Directors or with respect to the amendment of the by-laws?

"I will entertain discussion and questions. If there are none, I will now declare the polls open on the election of three Directors and the amendment of the by-laws, and I will ask members present if they want ballots to vote in person. Those here who would like to have ballots to vote in person, please raise your hands.

"One; any others want to vote in person?

"Do any of the regular members who have not sent in proxies and have, therefore, not voted previously, would you like to have a ballot? Are there others who have not voted by proxy?

"It should be understood too that those member companies who have sent in their proxy have a perfect right to recall your proxy and vote it in person. If you would like to do that, we will see that your proxy is returned to you. Does anyone wish his proxy, which has been mailed to the Association, returned?

"If there are no further ballots to be turned in, I now declare the polls closed on the election of three Directors and on the amendment of Sections 1 and 2 of Article IV and Section 2 of Article II of the by-laws.

"Now, at this point, gentlemen, I think it might be well to take just a few minutes and discuss your Association's business. Please feel free to ask any questions, to make any observations, be they constructive or otherwise. We hope, of course, they will be constructive, but feel free to join in your Association's business.

"You have a Board of Directors which devotes a great deal of time—their personal time—at the expense of their respective employers or from their own pocket and not at the expense of the Association, to meet monthly and to conduct the business of this Association, and I believe that you do appreciate the task they have and the wonderful job they have been doing.

"An Association like N.B.A.A. is no stronger than the men who work in it and after all, it is just a group of men who are banded together for a common purpose. It takes a few George's who will accept the responsibility to do that job and your Board is trying to do it, very sincerely, the way you want it done.

"We realize that it is humanly impossible to please everyone, although we shall strive to do it. There are many things the Association would like to do; there are many things which it thinks may be done over a period of time that have not yet been possible to do.

"For instance, you probably read, in an aviation publication within the last month, an editorial suggestion that National Business Aircraft Association should sponsor a national civil air show, that the air show, until now, has been entirely military and that the civil segment of aviation needed an air show, and without any consultation with N.B.A.A. this publication recommended that N.B.A.A. was the logical organization to sponsor a national civil air show.

"Now, that sounds fine. The Board has not yet had a meeting since that suggestion was made by the editor of the aviation publication, so what disposition the Board may take after deliberation, I don't know, but I think all of us do recognize that that is quite an order. It is a wonderful thing, probably, but it is one of those things that will be long range in aspect. It certainly could not be accomplished overnight.

"It might be two or three years away if the Association were to undertake it, and certainly it would entail complete coordination and co-operation with every segment of civil aviation, and that is quite an undertaking. It is going to involve a lot of people doing a tremendous amount of leg work to pull it off. But it may be done—I don't know—but that is one thing to think about.

"Another thing to think about; we have a national museum on aviation up in Washington. Have you seen it? It is disreputable. There is no organization in aviation doing anything at all about it. Somebody has suggested—and appropriately too—that National Business Aircraft Association interest itself in resurrecting, modernizing and making something out of the national aviation museum.

"There are prospects of this sort, of all kinds, that are thrown at us all the time, but we can only take on those activities within our means of accomplishment, both from the standpoint of manpower and dollarwise, so the evolution of our Association depends upon manpower and dollars to evolve into a stronger and a bigger Association.

"It is coming pretty fast. We are very well pleased. We have a 58 per cent increase in the number of associate members in the last two years; we have about a 40 per cent increase in the number of regular members; we have a 640 per cent increase in revenue. All of that is good, it's solid, it's sound.

"Now, I know that you must have been pleased with the Treasurer's report, seeing that we have a balance of some $34,000.00—and wondering why that money isn't spent. There are many things that we ought to do. We could spend the money easily enough. I don't know of anything easier to do and you men who are married know what I mean.

"I gave my wife $3.00 yesterday morning and told her she could report back on Friday night with an accounting and that's about the way we run N.B.A.A.

"Certainly there are many plans afoot to properly invest this money in the future of business aviation, and the money had to come before the services could be performed.

"We hope that out of this meeting will grow some demand for regional organizations over all the geography in America. We are very cognizant of the fact that at almost any city of any size, there are airport problems. There are problems of all types that need the participation of business people, business fliers.

"I know it would be wonderful to have an N.B.A.A. staff representative there but we do not have the kind of money nor enough people to make all of those meetings, but we now have by-law provisions accomplished last year, so that we can organize regional groups of N.B.A.A. people devoted to business aviation interests wherever they may be.

"If you are of the mind that you need such an organization in your community and will raise your heads just a little bit above the crowds and say, 'We are ready to organize; we are ready to carry on in the field,' this Board will immediately recognize you and charter you for that purpose, but that is something that has got to come from within. It cannot be imposed upon you.

"If you are interested enough in business aviation and have enough problems, that will come, and we hope it will. It should come as a request from you and not a demand from the high echelon of this Association.

"There are several other activities of the Association. We have recognized for the last few years, at least, the need for a media of communication. We use the old system of mimeographed sheets, and tried to keep you advised of what was going on. That is good but file 13 in my organization is the waste basket and we realize that file 13 in most organizations catches the bulk of mimeographed literature.

"We don't know if that media of communication is too effective or not. For that reason, this year arrangements were made with the national publication, SKYWAYS, as the official publication of N.B.A.A. Now, that publication itself will be just as good as you want it to be. It will be just as complete and informative as you want it to be.

"We honestly solicit you to contribute on any phase of any problem, and those pages will carry it within the limit of possibility.

"There are other activities that we are trying to found this organization on. I could go on for another hour with one thing after another, but I have touched some of the high points to give you the idea that your Board is active, that it is looking toward the future, that it is trying to use the best judgment available to it among its members, to give you a sound organization from which we can grow and not to make any fatal mistakes that will hurt this organization in any way.

"I am very proud of the progress the Association has made at the national level in Washington. Now, there can be no doubt but that every congressional committee in the House having to do with aviation now knows of business aviation and what a large segment it is of general aviation. They know its impact sociologically, economically, and what it means perhaps to the defense of this country.

"All of the bureaucracy and officialdom of our administration, the past one and the present one in Washington, are beginning to learn what business avia-

tion is and that is frighttully important in representing your interests, because, remember, gentlemen, it isn't what you want to do that can be done today.

"Washington plans four to five years ahead on every step that is made, so we are working with various committees in Washington today on matters that will not be finalized or in operation until 1960 or 1961 or even 1962. It is important work and some of that work cannot be published at this time.

"But we do have representation and you have it with men who are of your creed and who represent your interests.

"I am going to ask the Secretary to read the reports by the inspectors of election on the election of three directors and on the amendment of the by-laws."

William K. Lawton *(Executive Director and Secretary):* "The undersigned inspectors of election report that they received the votes of members for the election of the directors of the National Business Aircraft Association, Inc., by ballot and that the following persons received the following votes set up opposite their respective names, to-wit:

"For director for a term of two years Ralph E. Piper 160 votes. There are no other votes cast for any other candidate.

"For director for a term of three years, Henry W. Boggess, 160 votes; Mr. Joseph B. Burns, 160 votes; Mr. Robert C. Sprague, Jr., 160 votes; there were no other candidates balloted on and that is the official report by the inspectors for the Board of Directors.

"The undersigned inspectors of election report that they have received the vote of members for the amendment of Section 2 of Article IV for the by-laws of the National Business Aircraft Association, Inc., by ballot and that the following votes were cast for and against the proposition as shown below.

"For the amendment, 160 votes; against none.

"The undersigned inspectors of election report that they have received the votes of members for the amendment of Section 2 Article II of the by-laws of the National Business Aircraft Association, Inc., by ballot and that the following votes were cast in favor of and against the proposition as shown below.

"For the amendment 159; against 1.

"Finally the undersigned inspectors of election report that they have received the votes of members for the amendment of Section 1 of Article IV of the by-laws of the National Business Aircraft Association by ballot and that the following votes were cast in favor of and against the proposition as shown below.

"For the amendment 160 votes; against none.

"All four of these reports have been signed by Mr. Pomeroy and by Mr. Vance."

Boggess: "Thank you, Mr. Secretary. The report has been read and I now declare Mr. Ralph E. Piper a duly elected director of the National Business Aircraft Association for the two year term expiring at the annual meeting of members in 1958, and I declare the three present directors, Boggess, Burns and Sprague, duly elected as directors of the National Business Aircraft Association for the three year term expiring at the annual meeting of the members in 1959.

"I would like to also declare that the amendments of Sections 1 and 2 of Article IV and Section 2 of Article II of the by-laws have been duly adopted by the vote of more than a majority—in one instance we had 1 against 159—of the regular members of the Association entitled to vote at this meeting.

"Is there any more business, gentlemen, to come before this ninth annual meeting?

"If not, I would like to entertain a motion for adjournment of the meeting."

Member of the Audience: "I move for the adjournment."

The Chairman: "It has been moved that we adjourn so the meeting is hereby declared adjourned."

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The GIST of JET for Business

Continental Can Company takes the measure of a jet and finds it meets the specifications of efficient executive transportation

The three Fairchild M-185 10-place jet transports ordered by Continental Can Company will enable the company to fly 50 percent more miles than its present fleet of five piston-engine aircraft. This jet flight will be at twice present speed and at a lower operating cost per mile, Stephen L. Brown, chief pilot, announced today.

In addition to the M-185's, Continental Can Company also has placed an order for one Fairchild F-27, a twin propjet, pressurized executive transport, and Mr. Brown reported that the four aircraft would increase the number of air miles available to the company by almost 100 percent.

Basing his computations on the cost formula established by the Air Transport Association, Mr. Brown said that the M-185 will provide an operating cost of about $1.05 per mile, if the aircraft is flown a minimum of 600 hours a year and the purchase price is depreciated over a period of 10 years. This figure, he said, is lower than the per mile cost of operating the Lodestar, the Mark II Learstar, the Super PV or the Fairchild F-27.

Mr. Brown listed the cruising speeds, cost, amortization period and operating cost of the five aircraft as follows:

Lodestar — Cruising speed, 220 m.p.h.; cost, $250,000; amortization period, four years; operating cost, $1.20. Mark II Learstar—Cruising speed, 265 m.p.h.; cost, $350,000; amortization period, four years; operating cost, $1.20. Super PV—Cruising speed, 300 m.p.h.; cost, $450,000; amortization period, four years; operating cost, $1.19. Fairchild F-27—Cruising speed, 280 m.p.h.; cost, $750,000; amortization period, 10 years; operating cost, $1.18. Fairchild M-185—Cruising speed, 500 m.p.h; cost, $950,000; amortization period, 10 years; operating cost, $1.05. (The price of the F-27 and the M-185 would include special interiors designed to the users specifications, radio and spare parts).

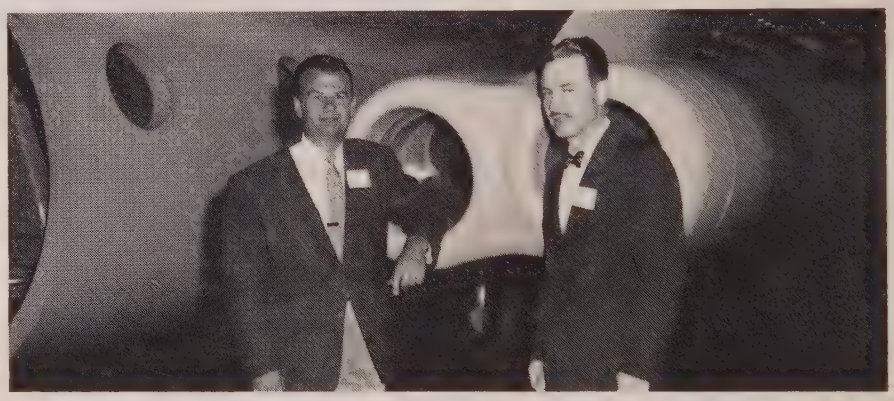
In computing the operating cost of the M-185, Mr. Brown doubled the per mile fuel cost recommended by the ATA because, unlike major airlines, few corporate aircraft operators pump their own fuel and must therefore pay standard retail rates at the various airports they fly into. Continental Can Company, which maintains a fuel supply at its Morristown, N.J., airport base, could save five cents a gallon on jet fuel by buying in bulk for servicing the F-27 and the M-185's at that airport, but the company's chief pilot pointed out that 50 percent of the fuel required would still have to be purchased at higher rates elsewhere around the country.

The Fairchild M-185 would bring about an important reduction in "deadhead" flying time with which corporations are often faced in the task of scheduling their aircraft to meet the needs of executives and other company personnel. The M-185 without passengers can be flown from Miami to New York in two hours and 20 minutes, compared with approximately six hours with present equipment, thereby increasing the plane's availability. "We could 'deadhead' the M-185 at 50 cents a mile, because our only cost factors would be the pro-rated crew salary, fuel and maintenance," Mr. Brown said.

Any corporation which has a need for 300,000 miles or more of air transportation a year can profitably use a jet transport in the M-185 class, Mr. Brown said. The annual cost of operating that mileage at 500 m.p.h. is $324,000 with the M-185, the per mile cost being in the neighborhood of $1.05.

He pointed out that a company operating one DC-3 at 200 m.p.h. and amortizing its purchase price of $300,000 over a four-year period will spend about $175,000 a year to travel 120,000 miles, or about $1.46 per mile flown.

"Need should determine a company's readiness to switch its operations to jets and by need I mean a minimum of 300,000 miles a year," Mr. Brown said. "Continental Can Company has that need, because of the normal increase in our business and the addition of new companies, including a few without aircraft, that have added many more plant cities to our air routes. This will mean a greater premium on our air transportation system and the speed of the M-185's will provide the means of covering the additional miles we will have to travel. Fortunately, we will be able to buy the advantages of the jet's speed at a reasonably low per mile operating cost."



STEVE BROWN, *Chief Pilot for Continental Can Co. (left), and R. James Pfeifer, Executive Director of Fairchild Engine and Airplane Corporation, stand near the engines of the mock-up of the Fairchild M-185 at the company's plant at Hagerstown, Maryland.*

A MOCKUP *of the 10-place Fairchild M-185, the first jet-powered executive transport. Continental Can Co. has ordered three of these transports. Prototype is scheduled to fly in late 1957; the M-185 has four 2000-pound thrust engines, will cruise at 550 mph.*

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SKYWAYS FLIGHT OPERATIONS ROUND TABLE

The SKYWAYS Round Table scheduled for the December issue, on **Medical and Physical Aspects of Safety in Flight,** *has been held for a later issue in view of the timely and valuable material discussed at the Panel Meetings at the Ninth Annual Forum of the National Business Aircraft Association, and in its place we are reproducing the text of the panel discussions.*

Radio & Communications Panel

McAllister Hotel, Miami, Fla., October 24, 1956

Presiding: Henry W. Boggess, Sinclair Refining Co. Moderator, Joseph L. Lacey, Chief Pilot, Sinclair Refining Co. Panel members: Bert A. Denicke, Systems Requirements, ANDB; D. K. Martin, Acting Director, ANDB; William B. Hawthorne, Chief, Stations and Frequency Utilization Branch, FCC; Richard Manhardt, CAA

Henry W. Boggess (Chairman): "I should like to introduce to you your Moderator, Mr. Joseph L. Lacey, who is chief pilot for the Sinclair Refining Company."

Joseph L. Lacey: "Ladies and gentlemen, I think that at the beginning of this panel discussion, I might state what I believe to be our purpose.

"It is to get together with a group of governing bodies, manufacturers of electronic radio and communications equipment in use by the public and try to trade a few ideas among ourselves and come up with some answers to be acted on in the future.

"The importance of this particular discussion can be amplified by comparing the operation of the electronic gear ten years ago when you could buy from the government surplus for a few dollars. Now you can buy a $50,000 aeroplane and you can put another $50,000 in it and still not be over-equipped.

"First on my right is Bert A. Denicke, chief of the Systems Requirements group of the Air Navigation Development Board."

Bert A. Denicke: "A.N.D.B. is a research and development organization and the things that we are actually working on today won't be in operational use for several years. I shall comment on things that will come up in the future and which will affect

Some participants in the Radio and Communications Panel (l to r): Richard Manhardt, CAA; William B. Hawthorne, FCC; Bert A. Denicke, ANDB; and Joseph L. Lacey, Chief pilot for Sinclair Refining Company, and Moderator of the discussion.

your communications work load.

"The first of these is an air ground data. This is equipment which would be carried on larger aircraft and it would take up the burden of routine air-ground communications. It might include position reporting, automatic altitude reporting, traffic control instructions and so forth. It might be one-way, from air to gound, or it might be two ways, air-ground-air.

"All of this position data could thus be communicated to the air traffic control centers.

"There is another air problem that will be involved in the future when, undoubtedly, large computers will be used in ground air traffic control. This requires that the position information be fed into the computer in some uniform way. For instance, if you are at a radial of 20° at 19 miles on Vortac station B, and someone else is on a different radial at a different distance on another Vortac station, the computer will have to reduce these.

"Another thing that may be in the picture: you heard today of all the radar equipment and you have read of the possibility of using air defense radars. Well, in the future we may have such a comprehensive surveillance system. In fact, the position reporting may be the reverse of what it is today. The ground may report the pilot's position to the pilot and only at certain times. The pilot himself may not initiate any of these contacts.

"There is an air traffic control beacon, a radar beacon, which will be put into operation in about three years. This will ensure the ground controller a plain identity of position and this will reduce the number of mandatory position reports.

"Another thing is a better navigation system when we all have a means of measuring distance in the aeroplane. It should reduce the volume of routine communications. How much we don't know. And speaking of navigation systems, beyond the type that we now have, we may eventually have here some sort of hyperbolic system, which would require only a few frequency changes.

"Air traffic control might have certain routes and of course, it is printed on aeronautical charts. This brings up a difficulty in making sure that everybody has the latest aero chart.

"We may see the time when the chart books that are now published, will be published with perforations so that the pilot can take the appropriate chart right out of the current facility book and slip it into the pictorial navigator and fly that part of the route."

Lacey: "Bill Hawthorne, Chief Stations and Frequency Utilization Branch, Aviation Division of the F.C.C."

William B. Hawthorne: "Actually, the F.C.C. is concerned with matters pertaining to licensing your radio control facilities on your aircraft and such ground facilities as you might require.

"Also, I have to do with the frequency coordination and frequency planning for the civil aviation service. A good bit of this coordination, of course, is required with the military agencies, and C.A.A. We all use some of the same frequencies and have some similar requirements.

A general view of the audience of the communications panel. Audience members kept the panel busy with questions and comments drawn from their own communications experience.

"I would like to point out, just to give you an indication of the number of applications we handle each year, that it is approximately twenty thousand a year for civil aviation. The number of licensed stations is quite a bit greater than that. I think about thirty-five thousand as of the last count.

"And I think it would be needless for me to go into the fact that any time you have any radio transmitting equipment aboard your aircraft, it is required to be licensed by the F.C.C."

Lacey: "Next on my right is Dick Manhardt, member of the air traffic control division of the C.A.A."

Dick Manhardt: "My job with the air traffic control service is in the future planning. I believe it would be more appropriate to talk about today's problems, rather than those that we are going to face in the next few years.

"Rather than simply telling you, I think I would like to hear your questions, and then if I have any information that I can pass around to you, I will be happy to do so."

Carl Pons *(Associated Radio, Dallas):* "I would like to pose a question to Mr. Hawthorne.

"About two years ago we came up with a little question of the public use frequency of 123.0, whereby a station would be licensed for each base operator on an airport to stand by to reply on this frequency, for taxicabs, fueling and service.

"It was kicked around quite a bit and we looked into it and we could find no interfering stations or things that interfered with it. We never did get an answer as to what happened to it.

"It looks like either it died a natural death or something else was offered."

Hawthorne: "Actually, the N.B.A.A. officially requested the R.T.C.A. to look into this problem and make some recommendations on it.

"The R.T.C.A. at its last meeting, the first Tuesday of this month, did approve a report. I will be glad to read some of it to you.

"A. 'It is recommended that the Federal Communications Commission authorize operational inspection messages to be transmitted on 122.8 megacycles.'

"I had better stop there—and here is a definition of 'special service messages'.

" 'It is those messages relating to the personal or business interests of the occupants of the aircraft insofar as these factors relate to the official portal to portal transit, of which the flight is a portion.'

"B. 'The second recommendation of the R.T.C. which was to authorize the additional channel 123.0 megacycles for aero-nautical advisory service use was: One, to limit its use to the transmission of operational special service messages; Two, to limit its use to aircraft communications, and Three, limit its assignment to ground stations at civil airports served by a control tower and to general aviation aircraft.

"C. 'Prohibit the connection of 122.8, 123.0 megacycles, voice radio circuits, to public or private land telephone circuits except those circuits which are required in connection with remote locations of transmitter receivers.

"D. 'Continue to authorize only aeronautical advisory station and one frequency channel, either 122.8 or 123.0 in the landing area.

"E. 'Continue to require the licensee of an aeronautical driveway station to provide service to all users upon request at all times when the station is in operation.'

"The last recommendation doesn't apply to the F.C.C. but I shall read it.

"F. 'When airborne traffic control towers or frequencies are required to serve general aviation aircraft, give consideration to the use of 122.4 or 122.6 megacycles instead of 122.9 megacycles and an airport served by an aeronautical advisory station operating on 123.0.'

"If I may elaborate just slightly on these recommendations.

"This committee in R.T.C.A. has had a number of sessions with a number of people present and it is my personal opinion that these recommendations are very good ones.

"I cannot, of course, tell you exactly what the F.C.C. will do, but they are

(Continued on page 42)

Behind the Hangar Door

Eavesdropping on the Forum for those who couldn't attend.

"It can be said that NBAA has arrived! The number of people, the number of exhibitors, the rank of the invited guests, the all-out cognizance given to the meeting by the government, military and airline factions, all add up to the fact that, as Col. Straubel said, 'a new star is risen.' It should be most gratifying to our charter members who have worked so long and so hard for success. Let's assure them that they haven't seen anything yet!"

"Official registration at the Forum approached the 600 figure, representing over 210 business firms. The Miami Committee demonstrated southern hospitality at its finest, and the various hotels cooperated with excellent accommodations and unsurpassed service. And of course the Florida weather was everything that the Chamber of Commerce claims it to be."

"Thursday night's Banquet featured, of course, the presentation of NBAA's 1956 Award of Merit to Captain Eddie Rickenbacker. Quite a few people expressed their displeasure that the name of the recipient is kept a secret until the banquet, but those who attended were certainly the richer for hearing Captain Eddie speak on the amazing possibilities of aviation. 'Aviation is limited only by the human imagination.' If you are skeptical about Captain Eddie's predictions, check the ones he made twenty-five years ago. His crystal ball has always operated very well."

"The First Nighter Hospitality Hour, Sunrise Breakfast, Get Acquainted Luncheon Florida Fun Night, Awards Luncheon and Honors Night were all events to be remembered."

"The Sunrise Breakfast at the Top o' the Columbus was a pleasure. Sponsored by Monsanto Chemical Company, St. Louis, Mo., the feature of the occasion was a film preview, 'The Moment of Decision,' a fine documentary film on aviation safety."

Mr. and Mrs. George Halpin and The Hon. Joseph P. Adams (center). We were delighted that the charming Mrs. Halpin accompanied her husband to the Forum.

"Much favorable comment from the hotel managers and distinguished guests on the businesslike conduct of the convention and the good deportment of the members. Mr. George H. Halpin, of Minnesota Mining & Mfg Co. even mentioned it in his speech at the closing banquet. One of the reasons no doubt was that throughout the hotels and up and down Biscayne Boulevard and Flagler Street one could tell the conventioners by their important looking zipper portfolios which were supplied by Fairchild and Southwest Airmotive. For a couple of days Biscayne Boulevard looked like Madison Avenue with palm trees."

"One of the things that really stood out was the amount of Rank and VIP's attending. At the ATC Forum on Wednesday the lineup was positively awe-inspiring."

"Official NBAA photographer Hans Groenoff had faith in the weatherman—as far as insuring good weather for the NBAA meeting in Miami. His faith was 'shook up' at the weather he found flying a Piper from Lock Haven to Miami in order to get to the meeting. Hans made contact with several farmer friends along the East Coast enroute, and after inaugurating a few new airstrips along the way he got to Miami in time to exercise his Camera. Results of Hans' camera work are all through this issue of SKYWAYS. A vote of thanks to the performance of the Tri-Pacer for getting him safely to Miami."

"Florida Fun Night was sponsored by NBAA with the grateful acknowledgement to the L. B. Smith Aircraft Corp., Miami, for their financial assistance in making Florida Fun Night possible. Everybody was enthusiastic about the event: the food was excellent, the entertainment fine, the drinks plentiful, and the setting as exotic as something in the movies."

"Socially the meeting was a big success. The Miami QB's magnanimously scheduled their Annual Wingding for our Monday night arrivals. Very thoughtful. It was an open party. attended by nearly 200 stalwarts plus a sextette fetching enough to draw huzzas from the assembled aircraft drivers."

"Meetings were held in two hotels and the Bayfront Auditorium. All that fresh air shook up Torch Lewis, Bill Benedetti and some of the other pilots."

"Ubiquitous is the word for Bill Lawton. We are still not sure that he might not be twins. Bill was everywhere, and had everything under complete control. He deserves a big hand for a well-run show. Still, he could not be everywhere at once, and he delegated his son Bob to look over the shuttle service furnished by Bell Helicopter from downtown Miami to the International Airport. Young Bob reported after his ride that the new four-place Bell was the last word in airport transportation, and that he found it much more quiet and vibration-free than the old whirlybirds his dad told him about."

Henry Boggess and staff of assistants occupied their hard-won Presidential Suite. At first they weren't quite sure they had it.

Aerojet-General Corp. advised everyone to "rocket up" to their room for additional boost.

Mrs. Louis S. Rothschild (l) and Mrs. Edward P. Curtis chat with Grover Loening.

We hope you didn't miss the bird's-eye view from Goodyear's blimp.

Cessna had the 620 at Miami for inspection. It has all that had been expected. Even the girls thought about wearing ties just to use the gold tieclips, found at each setting at the First Niter Banquet, distributed by Cessna.

Ken Boedeker, of Curtiss-Wright, was everywhere with his camera, adding new faces to his vast collection of pix of aviation's greatest. Ken is making an important contribution to aviation history. He has a gallery of faces going all the way back to Charles Lindbergh, whom he helped on his epochal flight.

Del Rentzel and Edward P. Curtis listen to Herb Fisher at the Honors Banquet.

"Observers Bill Prescott and Ken Skinner, Jeppeson Company, were present, taking notes and working with the NBAA Miami Committee to make their Denver meeting in 1957 an even greater success. Presentation of the buffalo-skin invitation at the last dinner gives us a clue as to their plans for an original and highly entertaining 10th Annual Forum."

"We don't know how many copies of 'Flight Operations Policy and Procedure Manual' Reading Aviation Service brought to Miami, but we are confident that they had none to take home. This comprehensive study condensed to easy-reading style was sought after by every pilot present."

"Chamberlain Aviation will long be remembered for their unusual static and pictorial display in their hospitality suite, prominently located just off the main lobby at the McAllister (as a matter of fact, in the McAllister bar!) Chamberlain's response to NBAA show participation typified the feeling of most exhibitors. This firm's representatives

concluded that 'registration screening assured proper audience, panel discussions conducted by top people produced stimulating debate and worthwhile results. NBAA's annual forums provide the opportunity for informal discussion among a qualified cross-section of the aviation industry.' They also said, 'See you next year at Denver.' Incidentally, nobody ever did find the sun deck mentioned on Chamberlain's card."

"The imaginative work of the exhibitors contributed a great deal to the success of the forum. There were many top calibre exhibits, informative literature, and useful gifts (the handsome plastic briefcases given by Southwest Airmotive and Fairchild are typical examples). Airwork's 'match your number' game was good fun. The Three Patriarchs of Steward-Davis were everywhere."

"Was that a sailfish they were loading aboard the Safe Flight DC-3 when it reluctantly turned north? All we know is that Al Heinsohn was busy demonstrating every minute that he wasn't attending business sessions. Flying low, maybe?"

Dick Henson, Fairchild Flight Test Chief, shares his technical knowledge with Rod Elliott and Rennie Brooks of Sylvania.

"Remmert-Werner invited NBAA to cocktails, dinner and a delightful evening at their fine new facilities at Pompano Beach."

"One of the few times that Hans Groenoff's eyes popped at someone else's photography occurred when he saw a display with three-dimension slides provided by Wilbur J. Zep, of Zep Aero."

"The Janitrol display attracted a lot of attention and a plenty of interested questions. Janitrol's gimmick was an electrified diagram of a complete aircraft heating system, which showed with lights exactly what happens when the pilot pulls the switch for heat. Things went so well for them that we're sure to see them next year."

"There was a lot of sound encouragement in Edward Curtis' speech on traffic control. It was gratifying to see that the NBAA forum attracted the interest of men like Curtis. It wasn't too long ago that business aviation was the industry orphan."

"After hearing Mr. Straubel's fine speech, the jet age doesn't look any more out of proportion than many other problems overcome by hard work and imagination. He certainly showed that the jet age was on its way, and the sooner the better."

"Even the most successful projects have an area for improvement. Consensus of opinion among the exhibitors was that the tight schedule of events coupled with an active social program left inadequate time for review of the displays. It is also unfortunate that all displays could not be centrally located. This will be remedied next year in Denver."

"The Honors Banquet was superb. We hope you didn't miss it. Henry Boggess, the esteemed outgoing President of NBAA, stood solemnly before the large gathering of members and guests in Miami's Bayfront Auditorium on the final night of the Forum. 'In every man's life there is one shining moment, and I am enjoying mine tonight.' "

Scott E. Miller at the AiResearch display explains a fine point to John R. Jeffries, visiting from Grumman.

"The smart pilots flying light aircraft landed at Brown's Airport, which is closest to Miami and farthest from airways traffic. Since Brown's was taken over by L. W. Ross last spring, the field has been enlarged and is now suitable for all light single and twin-engine craft. Ross provides complete service and maintenance facilities, and has a unicom station. Ed Marshall of American Mercury Insurance and Don Flower of Galbraith-Flower were among the visitors to Brown's."

Buck Criddlebaugh tells us that Fort Meyers Airways, at Fort Meyers, are all set for the winter fishing season.

"CAA, CAB and other government officials were most enthusiastic over the interest shown by NBAA members in their panel discussions. The free interchange of information proved to be most valuable to the Washingtonians, and has upset some of their former ideas on the professional attitude of NBAA members. The radio and communications panel wound up in a next-day session with NBAA members dead set on proving that existing 126.7 mc channel interference is raising hob with efficient airway traffic control."

"The prize for the loudest sport shirt went to the youngest-looking oldtimer, Grove Webster of Purdue University. Dark Glasses were worn by many of the early birds at the Sunrise Breakfast when Grove made his appearance. He steadfastly maintained that the glasses were hiding red eyes brought on by some late revelry. We hear it was Grove Webster who said, 'I see much more than I understand now that I have new glasses.' "

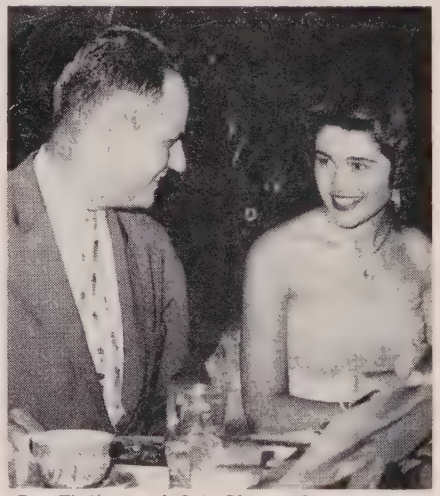
"The Futures Panel was good. Unfortunately, we ran overtime on the Annual Awards Luncheon, which set back the radar forum, which in turn got the Futures Panel off late. Regardless of the fact that it was most interesting, Marilyn Monroe couldn't have kept the rapidly thinning audience intact much longer. They were restive from so much sitting. As Cole Morrow so aptly phrased it, 'What one's brain can absorb is in direct proportion to that which one's seat can absorb.' "

"Aerodex made a standing offer to solve all kinds of convention problems, including the curing of hangovers. They had a suite in the Columbus Hotel with a complete oxygen system. Between whiffs of their own O_2, Stu Skidmore and Herm Walker extolled the virtues of their company's automatic materials-handling system at their Miami International Airport overhaul base. The new system is more efficient—makes things cheaper for Aerodex and the customer."

"The Aerodex booth was a popular meeting ground to study the Pratt & Whitney R-2800C cutaway engine."

"Federal Telephone and Radio Company's new tubeless automatic pilot for light business aircraft was of special interest to many."

"Since weather flying is of acute interest to everyone, RCA's working model of X-band 'nose radar' was in constant operation for the benefit of pilots concerned with the new innovation. Static displays of the same were on view in the exhibit room."



Pat Walker and Otis Shiver, Commissioner of the City of Miami.

"The five-division Bendix exhibit depicting fuel controls, complete radio and radar systems, instrumentation (with prominent mention of their active distribution organization) and a multitude of other component equipment drew wide comment."

Torch Lewis asks, "Why did the McAllister keep the stairways locked on the stairway side? Maybe to discourage nocturnal commuting, but it also made it something of an obstacle course getting from one exhibitor's suite to another. Some of us started out from near the top of the hotel down the stairway to the next floor. The door locked behind us and we had to hike down to the lobby. Needed three Bourbon sours for vertigo.

(Continued on page 48)

The 1956 Super 18 Beechcraft carries eight persons in luxurious travel comfort. Its superbly appointed, custom-tailored cabin — its big rugged frame — its powerful engines — and its unexcelled performance and utility are the result of the inspired craftsmanship which has produced more than 10,000 twin-engined BEECHCRAFT airplanes — world-renowned for their superiority of design and construction.

Ask about Beechcraft's Leasing and Financing Plans. Contact your Beechcraft Distributor or Dealer or write direct to Beech Aircraft Corporation, Wichita 1, Kansas.

Beechcraft distributors are located in 44 foreign countries. For information wr the Export Sales Department, Beech Aircraft Corporation, Wichita 1, Kans

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Iowa — Elliott Flying Service, Davenport

Kansas — Aircraftco, Inc., Wichita; Topeka Aircraft Sales & Service, Topeka

Louisiana — Currey Sanders Aircraft Company, Inc., Shreveport; Baton Rouge Aircraft, Inc., Baton Rouge

Massachusetts — Atlantic Aviation Corp., Boston

Michigan — Francis Aviation, Lansing

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Montana — Butte Aero Sales & Service, Inc., Butte

Nebraska — Lang Aircraft, Omaha

New Jersey — Atlantic Aviation Corp., Teterboro

New Mexico — Cutter-Carr Flying Service, Inc., Albuquerque

New York — Page Airways, Inc., Rochester; Atlantic Aviation Corp., Teterboro

North Carolina — Piedmont Aviation, Inc., Winston-Salem; Southern Airways Co., Charlotte

Ohio — Ohio Aviation Co., Vandalia; Youngstown Airways, Inc., Youngstown

Oklahoma — Aircraftsmen, Inc., Oklahoma City; Tulsair Distributors, Inc., Tulsa

Oregon — Flightcraft, Inc., Portland

Pennsylvania — Atlantic Aviation Service, Inc., Philadelphia, Beckett Aviation, Pittsburgh

South Carolina — Hawthorne Flying Service, Charleston

Tennessee — Capitol Air Sales, Inc., Nashville; Memphis Aero Corp., Memphis

Texas — Tradewind Airport C Amarillo; J. R. Gray Co., I Dallas; J. D. Reed Co., Inc Houston; Alamo Aviation, San Antonio

Utah — Kemp & Kelsey Airservice, Inc., Salt Lake Cit

Virginia — Piedmont Aviation Inc., Norfolk

Washington — Flightcraft, Inc., Seattle

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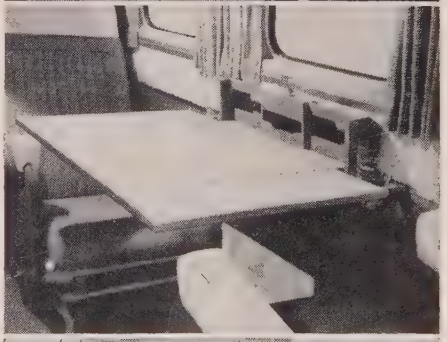
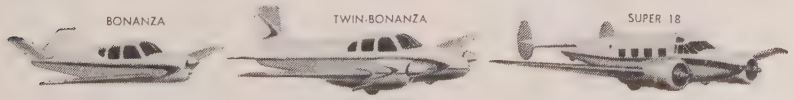


Beechcraft



BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

navicom

Devoted to information regarding the operation of business aircraft from first scheduling through flight completion, and the factors bearing on those operations, such as facilities, equipment, problems of navigation and communications, airspace regulations, new ATC procedures and new flying techniques. Comments and suggestions are invited.

New Navigation/ Communications Radio For Business Aircraft

A new single-unit navigation and communications radio for business aircraft has been announced by National Aeronautical Corporation (NARCO), Fort Washington, Pa. Known as the Omnigator Mark II it provides multichannel VHF communications, VOR navigation, ILS localizer guidance and 75 mc marker.

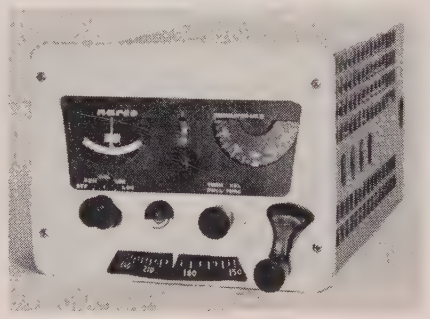
The new Mark II can accommodate 27 crystal channels between 118 and 123 megacycles, permitting use of every tower frequency currently assigned and many direct center frequencies for IFR operations. Channel selection is accomplished by means of a knob in the center of the face plate with frequency of crystal selected indicated through a small window above the selector switch.

Power of the New Omnigator's transmitter is double that of previous Omnigators and the band width has been tripled to permit use of frequencies within the 118 to 123 megacycle range. This has been accomplished by "broadbanding" a single, powerful transmitter circuit. The resulting transmitter has the simplicity and reliability of previous narrow-band systems, but delivers performance previously possible only with complex switch-tuning of multiple sections.

The face of the receiver tuning dial rotates with the frequency pointer remaining stationary in a vertical position. Automatically precise tuning to the frequency desired for simplex communications is provided by "whistle-stop" tuning, a feature first introduced by Narco with its Simplexer VHF transmitter and receiver. The system has proved extremely popular and permits tuning without looking at the dial.

The Omnigator Mark II embodies a new two-function VOR indicator, located in the upper left corner of the panel, incorporating a standard left-right blue-yellow meter for course presentation and a small window which displays "TO" or "FROM" indication. If a station is too far away or altitude too low for satisfactory VOR navigation a red "flag alarm" appears in the To-From window. VOR course is selected by means of a large wheel with graduated marking from 0 to 360 degrees, mounted horizontally under the chassis. A segment of the wheel is visible on the face plate. Knurling on the edge facilities rotating the wheel.

The Omnigator Mark II can be used for ILS approaches by turning the function switch to LOC, and tuning the proper ILS frequency. Outer and middle markers as well as en route fan markers, are picked up by a 75 mc marker beacon receiver incorporated in the Omnigator Mark II. This is an aural receiver, activated by pulling out the volume control knob.



Illumination across the top of the panel provides uniform lighting on the main face plate, the tuning dial and indicator which are sloped slightly forward to catch the light. The course selector drum has been moved forward for improved illumination.

The Omnigator Mark II provides all these improvements with no increase in over-all size and with an actual reduction in weight, by maximum miniaturization including miniaturized crystals and printed circuitry. The entire equipment is contained in a single case measuring 4¾" high, 6¼" wide and 10¼" deep, for easy mounting on the panel or in standard glove compartment. A separate power supply is installed elsewhere. Complete with antenna and cables the installed weight is under 18 pounds.

2½ Pound Combined Unit Permits Dual Omni System

Lear announces the development of VORTRAN, a unique, revolutionary new transistor-powered omni navigation system that is completely contained in a standard 3½ inch instrument case. It requires no separate converter, and can be used with all VHF receivers that cover VOR (omnirange) frequencies. The entire assembly, which includes a standard omni bearing indicator, weighs less than 2½ pounds and installs directly onto the airplane instrument panel. This is in contrast with conventional omni systems which generally consist of two units, the panel-mounted indicator and a ten or twelve pound remotely installed converter power supply. The VORTRAN's compactness and light weight now make *dual omni* installations practical for even *light, single-engine business* planes. Installation is extremely simple, requires only three wires, one each to ground, battery and the VHF receiver.

The VORTRAN utilizes etched circuitry and ten new-type silicon transistors. It features the use of a deluxe inductive resolver rather than the customary tapped potentiometer as a course selector. This results in far greater accuracy and eliminates crowded and blank sectors on the course selector dial. Bearing accuracy as fine as one degree has been accomplished during exhaustive flight and laboratory testing. Less than 0.03 amperes power is required to operate the converter, since no tubes are involved in its circuitry. The indicator portion of the instrument incorporates a rotatable course selector, a stable left-right needle indicator, and a prominent to-from indicator. The reciprocal heading is constantly readable through a rotating target.

Radar Weather Picture Via TV Relay Envisions Better Forecasting

A unique combination of Storm Detector Radar, television cameras and microwave relays bringing a 200,000 square mile weather picture directly to Air Force operations centers, has great forecasting potential. Recently demonstrated to USAF officials by Raytheon Manufacturing Co. and General Precision Laboratory, the radar-TV system provides the weather data of all types vital to round-the-clock flight operations. Raytheon CPS-9 Storm Detector Radar, GPL camera equipment and Raytheon television microwave units were employed in the demonstrations.

Prevailing weather conditions over a

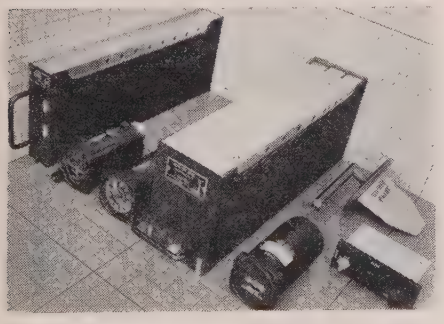
400 mile radius pictured on the indicator scope of a Raytheon CPS-9 Radar at the Air Force Research Center weather station atop Big Blue Hill in Milton, Mass. were continuously monitored by a high definition GPL vidicon television camera. This video information was transmitted via a Raytheon KTR television microwave relay to a KTR repeater station located on Katahdin Hill outside the L. G. Hanscom Field at Bedford, Mass. From the repeater station, the video weather information was transmitted to a Raytheon KTR microwave receiver located on one of the Air Force base buildings, thence by cable to the television monitor in the Hanscom Base weather station.

This system provides prevailing visual weather information from a central source to specific locations and supplements bulletins and forecasts. Storms and other unusual weather conditions as well as changes as they occur, plus the regular measured data from all locations enable more accurate and timely analysis by expert weather personnel. The microwave relay system is invulnerable to wind and ice.

Future plans may include simultaneous relay of weather information from Big Blue Hill to Otis Air Force Base, Logan International Airport, Naval Air Station, Weymouth as well as Hanscom Field. An appropriate grouping of similar TV relays from a number of adjacent or overlapping radar installations could present an overall picture of actual weather on a scale comparable to a regional weather map. (Note in the illustration the TV country-wide weather map presentation!)

Production Line TACAN

New complete commercial version of Federal TACAN can be used by itself to give a pilot distance and direction information, or *a portion of it* may be used in combination with VOR, a commercial directional navigation aid, to form a complete VORTAC air navigation system. The equipment shown here was developed at Federal Telecommunication Laboratories, Inc., the research and development division of IT&T. From left to right are: a bearing adaptor; a course indicator and a radio magnetic indicator (either or both of which may be used); a distance measuring equipment interrogator; a range indicator; a control box; and a protruding type antenna. A flush antenna may also be used. Of ½ ATR dimensions, the DME unit shown here weighs 35 lbs. and with the range indicator is optional equipment until sufficient civil ground installations are commissioned, Phillipsburg, Pa. being the *only* one currently near completion.



Air-Aids Spotlight

AMARILLO, TEXAS — *Back course ILS approach published based on VOR fix—Minimums to 300-1.*

ATLANTA, GA. — *Missed approach procedure for LF Range now left climbing turn to 2000 ft., hold on SW course of LF Range within 20 miles.*

BARTLESVILLE, OKLA. — *PHILLIPS Tower decommissioned.*

CHARLOTTE, N.C.—*ILS missed approach climb-out via radial of CLT omni* deleted.

CHICAGO, ILL.—*New BVOR at WHEELING, 7 miles N of O'Hare, ident. "EEL" on 116.2 mc—MIDWAY anti-noise patterns call for landing traffic maintain 2000 ft. until 3 miles from field, 1600 ft. until on 2 miles final. On takeoff Runways 13 and 18 avoid area immediately East and Southeast until reaching 2000 ft. North and Northwest takeoff straight out until past the canal.*

CHICAGO-DETROIT AREA — *New BVOR between South Bend (V-10) and Pullman (V-116) identification KEELER on 115.1 "ELX."*

CLEVELAND, OHIO—*Prospects good for VOR facility on 117.5 at CHARDON 16 miles SE of Lost Nation executive-base airport. Also at JEFFERSON 30 mi. SW of ERIE, on 115.2 mc "JFN."*

COLORADO SPRINGS, COLO. —*ILS Outer Compass Locator and radio beacon frequency changed to 407 kc.*

COLUMBUS, GA.—*VOR due recommission at new location—7 mi. 145° to airport.*

FORT WORTH, TEXAS — *GRAND PRAIRIE ADF beacon serving Runway 35 AMON CARTER Field now on 248 kc.*

GRANTSVILLE, MD. — *VORW commissioned on V-92 PIT-DCA, 8 mi. W of Cumberland, ident. "GRV" on 110.4 mc.*

GREENVILLE, S.C.—*LF Range towers* unlighted *near middle marker!*

INDIANAPOLIS, IND. — *Radar and VHF/DF both now available at WEIR Cook Field.*

IOWA CITY, IOWA—*VOR temporarily shut down.*

LETHBRIDGE, ALBERTA—*ILS system decommissioned except for localizer.*

LOUISVILLE, KY.—*Ground control at STANDIFORD on 121.7 mc; at BOWMAN on 121.9 mc.*

ONTARIO, CAL.—*ILS localizer frequency now 109.7 mc, glide path on 333.2 mc.*

ROCKFORD, ILL.—*ADF radio beacon identification changed to "RKF." New tower due early commissioning.*

SAN FRANCISCO, CALIF.—*Radar approach control commissioned.*

SANTA BARBARA, CALIF. — *ILS localizer frequency now 110.3 mc.*

SASKATOON, SASKATCHEWAN — *Hi-intensity approach lights commissioned ILS Runway 8.*

SEATTLE, WASH.—*On VOR-1 approach BOEING FIELD, altitude over HARBOR IS. FM now 1500 ft.*

SPRINGFIELD, ILL.—*VOR shut down until early February.*

TRENTON, ONT.—*ADF beacon "TR" frequency now 317 kc; "BO" frequency now 215 kc.*

WINNIPEG, MAN.—*Hi-intensity approach lights. ILS Runway 13-36 commissioned.*

SPECIAL NOTE — *VHF communication channels so crowded, BOSTON CENTER commissioned 124.4 mc, LAGUARDIA TOWER 120.4 mc. (Previous 120.3 broke up WASHINGTON and BOSTON communications.)*

SPECIAL NOTE—*Customs Port of Entry changes—Delete Grand Falls, North Head and St. Andrews, all New Brunswick; add Chatham. Delete Three Rivers, Quebec; add Gaspe.*

maintenance

This department covers cost-cutting, time-saving methods and devices for maintaining industrial aircraft efficiency. Technical tips from engine, airframe, electronic, instrument and other components manufacturers, CAA and AD notices, and other sources will be covered. Readers are invited to share their individual mechanical "know-how" with SKYWAYS editors, that it may be disseminated to all operators interested in business flying.

Airport Lights Essential for Winter

Safety in winter flying depends heavily upon adequate airport lighting, and all airport owners should now check their light systems for winter operations.

Landing accidents caused by poor maintenance of lighting facilities need not happen if those responsible perform their assigned roles. The airport management is responsible for the maintenance of facilities such as airport lighting. In case of unusual conditions, such as runway lights obscured by snow, the CAA publicizes them through the "Notices to Airmen," and CAA airport control tower operators advise pilots operating into and out of an airport.

In areas where deep snow occurs, constant monitoring and reporting of airport runway conditions and the effectiveness of airport lighting are essential.

James T. Pyle, Acting Administrator for CAA said, "The pilot has a right to expect ground aids to be available and operating properly when he needs them. To this end, we urge airport managements to complete their preventive maintenance program for winter as soon as possible, and to review their plans for prompt corrective maintenance of any difficulties which might arise during the winter."

CAA Suggests Care in Glass Cloth Recovering

One of the main disadvantages to the use of doped cotton fabric for covering on small aircraft is the comparatively rapid deterioration of the fabric and the need for an expensive recovering job within a few years. Glass cloth, which is at least as strong as cotton fabric and which is more resistant to aging, is not, however, the ideal alternative.

For example, there is no material now known that will shrink glass cloth into place as effectively as dope will shrink cotton fabric. If the glass cloth is the least bit loose, air pressure will cause it to "balloon," destroying the shape of the airfoil and possibly cause the cloth to tear. Although a tear is hard to start in resin-impregnated glass cloth, it will spread rapidly once it is started.

Glass cloth applied over existing fabric, using the original covering as a mold for the glass cloth, is approved by CAA only if the original covering is strong enough to be approved without further covering. If the glass cloth is fastened independently to the airframe over the original material, the plane is considered airworthy until the original fabric has deteriorated to half the original strength. A plane stripped of other fabric and covered with glass cloth is a major alteration, and requires engineering evaluation by CAA.

Three materials are in common use for filling and cementing glass cloth. The dope used for cotton fabric is the most economical, but does not adequately prevent the tendency of glass cloth to wear through internal chafing. Polyester resin is more expensive, but is hard to apply without bubbles. Best of all is epoxy resin, which is about twice as expensive as polyester and difficult to apply smoothly, but which gives a strong, flexible finish when used correctly.

New Radome For DC-3

McMillan Industrial Corporation, Ipswich, Mass., in conjunction with Reading Aviation Service, Inc., Reading, Pa., announces that they are introducing two new domes for DC-3 aircraft, one for "X" and one for "C" band, in order to provide their customers with a product that carries with it no compromise in efficiency.

Reading Aviation Service, Inc., is manufacturing the antenna mounting bracketry and dome attachment hardware. Attachment of the dome to the aircraft is simple. The antenna is secured to a hinged bulkhead at station 20. This provides easy access to both the antenna and the instrument panel. The dome seats itself around a guide ring also mounted on station 20 and further positive positioning is assured by means of two guide pins and sockets. The radome is hinged at the top and is capable of being raised 90 degrees. It is held in the raised position by means of two stainless steel supporting tubes.

The antenna mounting bracketry is so designed that it will accommodate any of the three radar antennae presently in production; Bendix, Collins, and RCA. A preformed absorbtion material will be supplied with the antenna mounting bracket. Both the radome and antenna installation have been CAA type certificated.

McMillan, one of the oldest fabricators of radomes in the country, is presently expanding its commercial production to include radomes for the C-46, Lockheed Lodestar, Convair, and DC-6.

Anti-Static Cleaner For Plastic Windshields

Because plastic windows and windshields cannot be cleaned properly with ordinary glass cleaners, a new product, called Acrakleen, has been developed to remove fine scratches and haze from the plastic windshield on aircraft.

According to the manufacturer, Acrakleen is a free-flowing powder containing a special anti-static agent. For best results, a little of the powder should be sprinkled on a damp cloth and rubbed briskly on the windshield. Acrakleen may be used with a damp polishing wheel to remove deep scratches.

In addition to its anti-static properties, the new plastic cleaner is non-flammable and non-toxic. It is effective on all kinds of plastic, including acrylics, polystyrene, acetate and rigid and flexible vinyls.

Million-BTU Heater Specially Designed for Aircraft Hangars

Two new vertical flow unit heaters, one exceeding 1,000,000 BTU per hour output, have been announced by the Young Radiator Co., Racine, Wis. These units are especially designed to heat airplane hangars, which are difficult to heat because the high ceilings cause air stratification. They are particularly suitable for maintenance and modification bases.

Three types of air diffusers are available: a revolving diffuser which turns a full 360° fitted with adjustable vanes to vary the diameter of the air spread; an "Aero-Jet II" nozzle for extreme mounting heights and high velocity air; and the conventional "Spreadaire" diffuser, adjustable to a 45° angle.

High Temperature Masking Tape

The Behr-Manning Co. has announced commercial availability of low cost pressure-sensitive crepe masking tape which will resist temperatures of at least 275° F. for one hour.

The new tape, called "No. 102 Behr-Cat," has a tensile strength of 20 pounds per inch of width. Elongation is 13.5%. Of 9-mil gauge, it has an adhesion to stainless steel of 33 ounces per inch of width. It is available in widths of ¼ inch upward.

The new tape is particularly valuable for the hot spray refinishing which has recently become available to maintenance bases. The hot spray process, which was described in the Nu-Avi-Quip Section of the August issue of SKYWAYS, has long been used by aircraft manufacturers, and may now be used by maintenance men to give an exceptionally smooth finish to business aircraft.

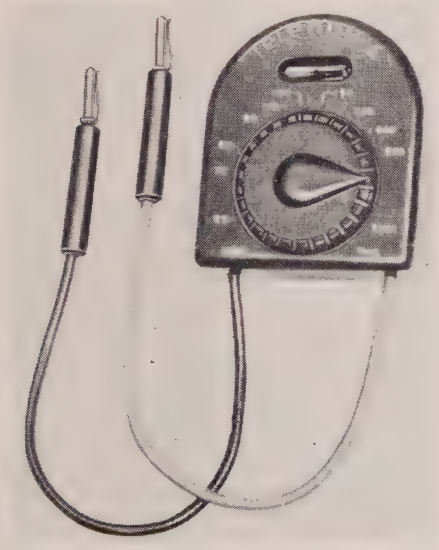
Airport Snow-Melting Material

A new chloride-free ice- and snow-melting material reported harmless to pavements, metals and vegetation, is announced by Speco Inc., Cleveland.

Called "Ice REM-CF," it is said to be 99.99% chemically active and to contain neither calcium nor chlorides.

Unlike ordinary ice- and snow-melting chemicals, CF does not produce a heat effect as part of its melting process. This makes it suitable for application on cement, concrete and asphalt. It is claimed that it will not corrode aluminum and other metals.

Because of its low depressing point, CF retains its thawing capacity at very low temperatures. It leaves no residue, and since it does not absorb moisture from the air it is easier to store than chloride-type products.



"MINI-TEST" POCKET VOLTMETER *will check unknown voltages from 65 to 800 volts, AC and DC. Voltages are read directly from the dial. Exclusive new clip-on type leads free both hands for work while the Mini-test is in use. A five-year guarantee is offered by the manufacturer, Omega Products, Chicago.*

. . . . in the business hangar

■ Lear Aircraft Engineering Div., Santa Monica, has begun conversion of Marathon Corp.'s Lodestar to Mark II Learstar. In addition to Mk II modifications, AED is installing Mk I radio system and L-5 autopilot system, and is modifying interior. A. C. Pinckley is Marathon's pilot; the plane is Mk II number four. ☐ Mk II number one, flown for Plymouth Oil by Jim Hackerson, is at Lear AED for first 100-hour inspection.

■ Chamberlain Aviation Inc., Akron, recently completed engine change and routine inspection of the Thompson Products DC-3. R. E. Sheriff, Thompson's CP, is NBAA Representative. ☐ Andy White and Reg Dawson had their Bendix Aviation Corp. DC-3 at Chamberlain for installation of Bendix TA-20 transmitters and other radio work. ☐ The DC-3 operated by A. M. Scaife, Pittsburgh, was in Chamberlain's hangars for installation of Sperry airborne ignition analyzer. Jim Leonard, Pilot, is NBAA Representative. ☐ Carl Donenwirth, Alliance Ware CP, brought their Twin Beech to Chamberlain for interior modifications. ☐ The Aero Commander operated by Farrell Cheek Steel Co. was brought to Chamberlain for control surface repairs. Pilot is Joe Dee.

■ Executive Aircraft Service, Dallas, has completed conversion of the DC-3 used by Tennessee Eastman Co. Conversion included 8000-hour overhaul and such special installations as: landing gear wheel doors, Janitrol heater in tail section, picture windows, new engines and short exhaust stacks. The new paint job included use of Eastman's experimental clear butyrate lacquer on unpainted areas, a first in aviation. Interior fabrics were specially woven by Eastman. Pilots Leo Boyd and Ralph Bailey were on hand while work was in progress. ☐ Trinity Drilling Co. has purchased a Beechcraft D-18 from Executive Aircraft Service; Trinity pilot is W. L. "Poddy" Parrish.

■ Butler Aviation, Midway, Chicago, has completed engine change, modifications and 1000-hour inspection of Danly Machine D-18S, Jim Fink CP. ☐ Giddings & Lewis Co.'s Lodestar visited Butler for installation of Goodyear brake system, 100-hour inspection, and some airframe and engine items specified by CP Doug Lionberger. ☐ The Sears, Roebuck Twin Beech D-18S was brought to Butler by CP Vic Swanson for 1000-hour inspection and partial interior conversion. ☐ Kroehler Mfg. Co. brought their Lodestar to Butler for 100-hour inspection, installation of Winslow Oil Filters, vibration suppression kit and minor modifications to the plane; CP is Bob Hanson.

■ Timmins Aviation Ltd., Montreal, has completed its 6th conversion of a C47 this year, the latest for Transports Aeriens Intercontinentaux, Paris. ☐ C47 follows delivery of a completely converted DC-3 to Wheeler Airlines, Quebec; DC-3 features combination air-stair door and C47 cargo door. It can be converted from 28-passenger to full cargo. ☐ Timmins sold a Royal Gull to Quebec Dept. of Lands and Forests, for the use of Minister Hon. J. S. Borque; CP is John Bonnard. Gull features ARC radio and Safe-Flight installations.

■ Van's Air Service, Winona, Minn., completed 100-hour inspection on Aero Commander operated by Hoover Motor Express. ☐ Hugh McCorkle, CP for DeKalk Agricultural Assn., brought their Aero Commander and Navion to Van's for 100-hour inspection. ☐ Marathon Corp. sent their Aero Commander to Van's for 100-hour inspection, and radio work.

■ Garrett Corp.'s AiResearch Aviation Service Div. is installing new deicer boots on the wings and stabilizer of Abercrombies Martin B-26. New tires and other miscellaneous changes are being made on the plane, which was brought in by Pilot Bernie Clapp. ☐ The Second Royal Australian Air Force Convair 440 was given a complete interior modification by AiResearch. This includes an executive compartment with two divans, a booth seat and table, a forward compartment with eight double chairs and four tables, a navigator's station with drift sight, periscopic sextant, instrument panel, etc. ANK-10 radar with scope in cockpit, scope and radar control at navigator's station, radio operator's station in the cockpit, large buffet facility with mechanical refrigerator and a forward lavatory. ☐ Pittsburgh Plate Glass had an electrically heated windshield installed in its DC-3 by AiResearch, as well as the AiResearch modified aileron boost. An exterior three-color paint job was applied, and interior touch-up. Pittsburgh Pilot is Buck Newton. ☐ The DC-3 of Sears, Roebuck & Co.'s Los Angeles Div., Pilot George Fleming, was given an exterior three-color painting and other miscellaneous work.

■ Dallas Aero Service, Dallas, changed the right engine, overhauled accessories, replacing wing fabric with metal skin and completed a general overhaul of Orinoco Mining Co.'s Grumman Goose, based in Caracas. ☐ DAS has completed the installation of Janitrol heaters, cabinet work, American wiring system and change of right engine on Ringby Truck Co.'s deHavilland Dove, based at Denver. ☐ The M. L. Mayfield Dove, from Houston, has had a 100-hour inspection, relicensing, new interior and new paint at DAS.

(Continued on page 47)

Mrs. Higdon Receives Her Well-Earned Cup

MARIAN HIGDON *receives the Business Flight Safety trophy from Herb Fisher (r), Chief of Port of New York Authority Aviation Development Div., and Robert Kane (center) Univ. of Miami. Mrs. Higdon is president of the Women's Aeronautical Association of Kansas. Husband Lee Higdon is Chief Accountant at Beech Aircraft Corp. The Higdons have three sons, Allan, a student at Kansas Univ., David, a student at Wichita Univ., and Phillip, age 8. Mrs. Higdon is also active in church work, PTA, Fraternity Mothers, Cub Scouts.*

Biz Flying & Govt Program

(Continued from page 13)

association took occasion, in a most American fashion, to let me know, and immediately, that after the decision had been once reached NBAA would work wholeheartedly with us towards the successful implementation and completion of a short distance navigational system which will be usable by all. Even though some of your members may consider themselves affected in the immediate future, with the importance which the majority of your operators attach to area control and to having the flexibility for going in and out of both military and civil airports, I am sure that you will find that this decision will work to your advantage in the long run.

"The CAA is working hard on the design, siting, and other problems involved in reaching the goal of VORTAC service from some 300 locations by July 1, 1959, plus the addition of distance measuring service at approximately 70 Instrument Landing Systems. At the same time, it is going ahead full speed on its program of expanding VOR service, since both ground and airborne units are immediately available, and, in fact, are already the initial as well as the primary part of the VORTAC system.

"Concurrently, the Air Navigation Development Board is working to complete by November 1, 1956, a statement of VORTAC system components to guide manufacturers of airborne equipment, so that they can be in full production in time to match the ground installation capabilities.

"Meanwhile, we recognize that continued use of the present distance facilities will be of benefit not only to the business flyers who have sets in their aircraft, but to the government and to all other flyers in terms of providing operational experience with distance service. We appreciate the pioneering work done by NBAA in the operational use of distance information. As you know from the ACC report, we plan to keep operating until about 1960 as many as possible of the approximately 230 DME stations now on the air. The ACC plan provides that they will be turned off before that time only where some frequency or other conflict arises because of VORTAC going into service.

"VORTAC is only one element in our program to meet the need for an air navigation and traffic control system capable of giving fast and safe service to an ever mounting volume of traffic. There are many other elements, all of which must be meshed in at the proper time and place to make this complex mechanism work smoothly.

"The role of VORTAC is to give the pilot a means of following his course more precisely, and of reporting his position more accurately. At the same time, we must give our controllers better tools to serve the pilot, a term I use inclusively to embrace everyone from the man who flies along behind a 60 horsepower engine to the jet pilot who flies through space at supersonic speeds.

"These needed tools fall into three general categories: radar, as the controller's eyes; direct communications, as the controller's voice; and automatic devices to act as the controller's bookkeeper and secretary.

"As you know, we have announced a $246 million program for blanketing the country with these vital aids, and Congress gave us $75 million to start on it this year. This was not as much as President Eisenhower asked for, but it's still more than twice any previous year's appropriation, and we expect to make some really big strides with it. In fact we are proposing to expand it even more as we accelerate the implementation plan.

"During the first three months of the fiscal year which began July 1, we obligated $15 million for this purpose, and we're slashing red tape in every way possible to get the needed equipment into production. Within the last two weeks, for example, a contract was awarded for 86 VOR ground stations. at a cost of more than $1,700,000.

"The CAA electronics and procurement people have a tremendous job to do in a limited time. because their share of the program must precede the training of personnel to operate and maintain these devices. and we have a three-year goal for completion of the whole works. We're counting on them and the manufacturers to come through, however, and I might add that the splendid cooperation of the military is aiding greatly. They are fitting CAA orders into military production lines, lending aircraft for high altitude flight checking of the new facilities, and are working closely with CAA on the possible joint use of air defense radar.

"One of the important objectives we hope to achieve through installation of VORTAC, radar. and direct communications, is all-airspace traffic control at the higher altitudes. This *area*, as opposed to *airway*, concept has long been advocated by NBAA, and will benefit the business flyer more and more as he acquires planes that fly higher and faster. It will give him the assurance of good traffic control on his many off-airway flights.

"It would do more harm than good, however, to attempt to offer such assurance until we are fully prepared to make good on it. We need a lot more equipment in place and people on the job before area control is a reality, and this sort of thing cannot happen overnight. We're going into it as rapidly as practical, but it has to be a gradual process. To get our feet wet, we plan in April 1957, to start controlling all aircraft flying on instrument flight

plans over 24,000 feet. We will lower that floor to perhaps 15,000 feet as soon as possible. Full air traffic control over all aircraft operations at these higher altitudes will begin when adequate radar and communications are available. Experience may show that the concept can be applied even lower, with benefit to everyone. Our minds are open; we are governed by no preconceived notion except one—that it is our job to serve *all* who use the airspace.

"Among those users, the business flyers loom large today, and promise to become an even more important factor in the years to come. The field is alive with activity and new developments. Civil aircraft production was 42% higher in 1955 than in 1954, and the first six months of 1956 show a 44% increase over the same period of the previous year.

"The trend toward larger utility in executive planes is apparent from our new production records. The four-place and over aircraft now represent 83% of the total planes built weighing less than 3,000 pounds. Four-place planes increased 51% over 1955, and five to seven place planes 47%. Another indicative comparison as to the phenomenal increase in business flying is that out of the total general aviation hours flown in 1946, 11% was accomplished by business aircraft. In 1955, this percentage had increased to 45% of the total figure. By 1965, the CAA estimates that this percentage will increase to more than 50%.

"Although the bulk of the civil aircraft output continues to be the popular four and five-place single engine airplane, which accounts for such a large proportion of the general aviation business flying, the civil aircraft manufacturing industry recently has turned its attention toward the small twin engine aircraft of four to six-place, such as the Piper Apache, Cessna 310, Beechcraft Twin Bonanzas and the Aero Commander. Demand for these small twin engine aircraft for business and industry has been very encouraging. Output of these small twin-engine executive planes showed a 45% increase over the previous year—830 against 571 planes. Piper was the leader in this category with 343 Apaches; Cessna was next with 262; Beech shipped 130 Twin Bonanzas; and Aero Design shipped 95 of its Commanders.

"Among other things of interest to you—one producer has established a retail financing plan for new and used airplanes similar to that on automobiles. Leasing of business aircraft is gaining further acceptance among companies which find it meets their particular needs.

"Engineering developments hold out great promise for business flying. Just to mention a few suggests the scope of possibilities: boundary layer control, convertiplanes, steep take-off and landing aircraft, roadable airplanes. Research in these areas for military purposes should yield beneficial by-products for business flying, and it might even be that work in the automotive industry on small turbine engines could prove adaptable. Definitely on the horizon are pressurized, propjet, and pure jet aircraft specially designed for executive use.

"Symbolizing recognition of the importance of the business aircraft is the development of facilities specially geared to meet their service needs. New and enlarged facilities have recently been completed or are now under way in Los Angeles, Dallas, St. Louis, Chicago, Detroit, Miami and Atlanta.

"Taking all factors into consideration, especially the favorable economic climate which I expect will continue, this lusty young giant, business flying, has an even more remarkable period of growth ahead. From the 3.9 million hours of business flying in 1954, I predict a 46% climb to 5.7 million hours by 1960. By 1965, the total should hit 7.8 million hours, and in 1970 it will reach a peak of 9.9 million hours.

"This growth will not be without its problems, of course. Like any fast growing youngster, business flying is going to need lots of pairs of new shoes. I don't subscribe to a paternalistic philosophy of government, so I can't say we'll buy them for you, but we'll at least do our best to see that you're properly fitted at each stage of your development."

Pat Walker, Miss Business Aviation 1956

From Tyler, Texas, Pat works for Delta Drilling Co. She enjoys all sports; Pat stands 5' 6", tips the scales at 120, has brown hair, hazel eyes; her specifications are 34-22-36—perfect.

NBAA Increases Board Membership

The Board of Directors of the National Business Aircraft Association, Inc., has authorized an increase in the Board membership to eleven, and has deferred the selection of their new president until the first meeting of the new Board. Announcement of the new president will follow the first meeting.

The Board of Directors is at present composed of nine members: Henry W. Boggess, Walter Pague, Gerard Eger, Cole Morrow, Joseph Burns, Ralph Piper, Eugene Spetnagel, Robert Sprague, Jr., and Curt Talbot.

The names of the two new directors will be announced following their appointment by the present Board in accordance with the by-laws of NBAA.

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General News

Still Not Too Late

During September 1956 the new single-section Instrument Pilot Written Examination was placed in field use by all CAA Aviation Safety District Offices, as the official examination for all "new" applicants.

In this connection it is suggested that all applicants who have successfully completed one or more parts of the sectionalized examination, and who wish to complete the written examination requirements by taking only those sections previously failed, should arrange to do so *prior to January 1, 1957*. On that date the sectionalized examination will be declared obsolete and removed from field use.

Jet Backlog Shows Increase

According to an announcement made by the Aircraft Industries Association, five major American aircraft manufacturers now hold firm orders or options for a total of 600 jet and turboprop passenger transports.

Latest available data shows that seven of the total 600 are to be delivered to private business concerns or to individuals. Four Fairchild F-27's and three Fairchild M-185's comprise business aviation's quota.

Two hundred and fifty-nine of the total, valued at $323.5 million, are turboprop powered. Both twin- and four-engine turboprops are represented in this figure.

The remaining 341 are all four-engine jet transports, costing $1,741 million. The combined jets and turboprops have a value of over $2 billion.

Proposed CAA Study Anticipates Expansion of Air Taxi Operations

Anticipating inter-city helicopter operations, the CAA is planning a first-hand study of navigational aids, communications and traffic control problems associated with air taxi operations.

According to James T. Pyle, Acting Administrator, the CAA has been working with the Navy in a program involving S-58 helicopters equipped with automatic stabilization gear and other equipment for instrument flight.

"We are hoping that the CAA will be able to obtain from the Navy or the Army a specially equipped helicopter," Mr. Pyle said, "so that we can find out for ourselves the answers to questions like these:

"What peculiar problems will be encountered in helicopter traffic control? How effective are our present airway aids in helicopter service? Do we need to develop new aids? Is our present communication system adequate? What additional heliport requirements are we likely to need for instrument flight? What kind of standards should we apply to pilots seeking a helicopter instrument flight rating?

"We hope to come up with some of these answers soon, not by guessing, but by actual tests with a modern helicopter."

Needs of Business Pilot

(Continued from page 17)

lines. The active fleet of aircraft used for business purposes is now estimated to exceed 20,000 units and positive evidence of their value to business is the fact that more than 90 of the nation's 100 largest corporations now operate one or more aircraft.

"I believe the opportunities are still good and getting better in the business of service and maintaining the business fleet. More competition will give us better service and still support the provider of that service. That's if he conscientiously conducts a good service. No business plan operator can complain about a reasonable bill. He only complains when he feels he is being royally taken. He needs good service and he is willing to pay for it.

"Loop holes in your fixed base operation are such as these: A Lodestar in Ohio ferries to Los Angeles for 100 hour checks. A DC-3 from Chicago goes to Dallas empty every 100 hours. A Lodestar and a DC-3 fly empty every 100 hours from New York to Tulsa and back. What goes on? Is business management going to allow such wasted flying time to continue? Their business was not developed on such unsound practice. If you have business planes leaving your area for maintenance elsewhere, there are only three possible causes:

"1. Your service is not adequate.

"2. Your service is not advertised.

"3. Or you *could* have tried to slay the goose that laid the golden egg.

"Another phase of service and back to first impressions. Many airports have completed new terminal buildings and others will be following the pattern shortly in order to keep abreast of the traveling public. In many instances, the old terminal building is practically abandoned to the pigeons, rats, cockroaches and vandals. The city sees fit to spend millions to impress the traveler who comes in by commercial airline. What is being done to impress the chairmen of the board, board members and large stockholders who come in business planes? They are not even allowed parking space at a gate at these new terminal buildings. In many cases, they are forced to commute from a remote spot on the field by automobile to meet business associates at the main terminal building. They have probably stepped off a nice clean carpeted aircraft onto an oily tar ramp surrounded by fuel trucks, bits of cowling, tractors, tow bars and, in addition, probably punished by a propeller blast from an engine being run up. What is wrong with the fixed base operators cooperatively taking over the old terminal buildings and keeping them in order? There is nothing wrong with your advertising the fact that you are doing so and listing your service in the lobby. New Orleans, I think, is a beautiful example of the system working. Everybody gets a stab at the gas and oil business and all are supported. The competition is keen but in the past two or three years I haven't noticed any of them going out of business. The service ranks with the best in the country.

"Another thing that should encourage you about this business flying business is the advent of the light twin. Many firms did not buy aircraft in the earlier years after World War II because they had so many people going different places and even the larger companies hesitated to dispatch a Lodestar or DC-3 or even a D-18S to a destination with only one passenger. Those were the only airplanes that you could get a few years ago. Now you can buy three or four light twins for the price of a plush DC-3. With practically the same comfort, same safety and often greater speed at far less cost you can now dispatch a light twin to a destination with one man aboard and not feel half so guilty, in fact it is a justifiable expense. During these past 11 years the aircraft industry has had two shining examples of enterprise to offer. They are definite advances. The light twin and the one and only new modern airplane to be developed exclusively for the business fleet. The 620. As Charles Kettering stated a year ago at our NBAA convention at Detroit, "At very best, we have been flying around in war-weary, reupholstered buses."

"I believe that Dwane Wallace and Ralph Harmon and their associates at Cessna need a loud, encouraging hand from the rest of the industry for their farsightedness and faith in business flying to invest more than six million dollars in the initial production of this new aircraft. This is the only example in which a fat military contract has not paid for the development of a new airplane. Consequently, we have an airplane that we will soon be able to fly in our business fleet and we will not have to wait until the military lists it as obsolete and inadequate equipment. We will not have to convert it. It was tailor made for our use.

"Many of you operators are distributors or dealers of aircraft. Certainly you can see by now that business is geared to the speed of the airplane today and not the horse and buggy nor even the fast trains. Business is going to continue to use airplanes, will need to buy parts, maintenance and service. If business, big and little, survive it will depend upon the airplane and you, the fixed base operator, your field is not half full nor is it doing half as much as it can to match the needs of business flying.

"I am not going to go into maintenance and maintenance needs as thoroughly as I might. I certainly do not feel qualified to step in and tell any fixed base operator how he should run his maintenance department. I would not appreciate having a fixed base operator try to tell me how to run my business. I believe you will find most of the pilots qualified to tell approximately what a certain job should cost today. I believe we are okaying bills that give you a reasonable profit and keep you in business because we need to keep you in business.

"There is one thing that I feel will eventually come and that is a greater standardization of maintenance procedures. I know the CAA has attempted to create a standardized program with its periodic check lists. That approach works fine for those operators who use periodic checks but does not cover the problems that confront the operator using a progressive maintenance system. The manufacturer, I think, in time will engineer aircraft and power plants to such a point that engines can be swung from one airplane to another and from the test stand to the airplane in a matter of minutes as against the present system of several hours or even days in case of the large power plants.

"Summarizing our needs I should like to state it simply. We spend hundreds of thousands of dollars to convert our airplanes and to make them safe and comfortable. We spend thousands for maintenance and service. We train our crews to fly them safely and to give the very maximum in service for the comfort and ease of the passengers. We want the services we purchase from you to be commensurate with those we furnish our passengers on the airplane. We are willing to pay for those services, but since we are paying for them we expect your very best—no substitutes or excuses. That is what our employers expect of us 100% of the time."

NBAA Membership

Information regarding regular or Associate Membership in the National Business Aircraft Association is readily secured by writing to the Executive Director and Secretary of NBAA at 344 Pennsylvania Building, Washington 4, D.C.

Membership in this non-profit and independent aviation organization is based on the recognition of business flying problems common to all users of aircraft for their business purposes and to those engaged in supporting the operation, servicing, equipment, and manufacture of business aircraft.

Among the fields in which NBAA is concerned are: improvements in airways and airports, better weather service, expansion in communications and air navigation facilities, higher standards of airport services, improved aircraft parts distribution, equitable tax rulings for business aircraft operations, greater recognition of the airplane as a necessary tool in modern business and industry, better air traffic control procedures, professional status for qualified business pilots, and aircraft designed to meet the special requirements of business flying.

safety exchange

A clearinghouse of practical information on recent developments affecting flight safety. This will include factual accounts and analyses of actual, in-flight occurrences (near misses, unusual in-flight experiences, conflicting traffic clearances, and other incidents of non-routine nature. In addition, CAA, CAB reports and other sources will be briefed.

Ralph Piper, Chief Pilot, Monsanto Chemical Co., St. Louis, is NBAA coordinator of the Safety Exchange. Readers are urged to advise Mr. Piper of all ideas which may contribute to the safety of business aviation. Address him c/o SKYWAYS for Business, 122 East 42nd Street, New York 17.

CAA Develops New Method For Checking Navaids

Every air route air navigation facility in the United States can be checked every 30 days under a new system, instead of the 120 days that might otherwise be required.

The new method divides the entire country by east-west and north-south grid lines 100 miles apart. CAA patrol planes, flying the grid lines and carrying newly developed electronic equipment, will receive signals from a succession of CAA radio ranges and other navigation aids, instead of orbiting around individual stations.

The signals will go through airborne computers, and be recorded on tape for final processing at the CAA Aeronautical Center, Oklahoma City. Information on any inaccuracies revealed there will be dispatched to ground crews around the country for corrective action.

The grid method was devised by Arthur E. Jenks, Chief of Flight Inspection Division, CAA Office of Air Navigation Facilities, and developed by his staff for use in high-altitude aircraft soon to be available to CAA.

The new flight check aircraft, flying at 20,000 feet along one of the grid lines, would receive signals from facilities within approximately 100 miles on each side of the flight path. Thus each aircraft would, in effect, check a swath of 200 miles along its course receiving slightly more than 90 degrees of the signal emitted by an omni-direction station on a westward flight, and another 90 degrees when it flies the adjacent grid line eastward. With another plane flying a grid line northward and returning along the adjacent line southward, the entire signal area of the station is checked on the two flights.

The CAA recently met with 30 systems engineering, research and manufacturing firms to discuss the airborne computer and recording requirements.

Tests Begin on Adaptation of Arresting Gear to Civil Aircraft

An agreement has been announced between the City of Woodbine, N.J., and the E. W. Bliss Co., Philadelphia, for a five-year lease on the Woodbine airport. The company plans to operate this airport as a facility for development tests on runway overrun barriers and aircraft arresting gear.

Initial adaptation of the airport to the test program will begin this month. The final installation will include a catapult which will be used to accelerate test vehicles and dummy aircraft to the speed necessary to simulate actual emergency aircraft arrestments. Results of the tests will be used to design arresting gear for civil and military aircraft.

The Bliss Co. has been engaged in the manufacture of catapult and arresting gear equipment for the Navy, and has conducted independent experiments on the practicability of such equipment as a safety factor for civil aircraft. The company reports that the Air Force has successfully used Navy barrier equipment at several U.S. bases, resulting in savings in aircraft and a reduction in injury to personnel.

One important engineering factor will be the weight of the engaging device on the aircraft. However, the load applied to land-based installations varies, in use, from .5g to 1g., as compared to Navy carrier service where the load on the arresting device may be as high as 6g., and it is anticipated that for civil use the engaging device may be incorporated into the landing gear with minimum weight penalty.

As experiments progress, configurations of all types of aircraft will be used, although initial tests will be made on military planes. It is reported by the company that one of the prime considerations will be to provide equipment that will, from a cost and maintenance standpoint, be suitable for municipal airport usage.

CAB Issues Statistics on Accidents In Executive and Utility Aviation

The report of the Bureau of Safety Investigation of the CAB has been expanded, in its coverage of the years 1954-1955, to include accidents in General Aviation as well as those in U.S. Civil Air Carrier Operations. Although the report covers only those business aircraft of more than 12,500 pounds certificated take-off weight, the conditions under which the accidents occurred are relevant to any business aviation operation. Excerpts from the CAB accident report follow.

"In General Aviation flying involving fixed-wing aircraft in excess of 12,500 pounds certificated take-off weight, and helicopters, 51 accidents were recorded as follows:"

Executive (Corporate): 12 accidents to fixed-wing craft, 0 to helicopters; total: 12.

Other general aviation: 6 accidents to fixed wing craft, 33 to helicopters; total: 39.

"In relation to the 312,000 hours flown in executive operations during 1955, the accident rate per 100,000 hours was 3.84; the fatal accident rate was .96 per 100,000 hours flown. In the 1953-1955 period, 34 accidents were recorded in executive operations and 872,000 hours flown. The accident rate per 100,000 hours over the period was 3.89. Included were; 0 fatal accidents and the rate was 1.1."

CAB shows the following statistics concerning the operation phase in which accidents occurred: of the 12 accidents to fixed-wing executive craft, 1 occurred while starting engines, 2 occurred while taxiing to take-off, 1 while taxiing from landing, none occurred in take-off, 3 occurred during normal flight (2 in normal cruise, 1 in enroute descent), and 5 occurred in landing (2 in final approach, 1 in touchdown, 2 in roll).

Of the 6 accidents to fixed-wing general aviation planes, 2 occurred in taxiing to take-off, 1 occurred in initial climb, 1 in normal cruise, 1 in final approach, 1 in roll after landing.

Of the 33 accidents to general aviation helicopters, 2 occurred in ground phase, 2 in initial climb, 2 in climb to cruise altitude, 19 in normal cruise, 4 in final approach, 4 in level-off.

Of the 12 accidents to executive fixed-wing aircraft, 2 of them resulted from wheels-up landing, 3 from collapsed gear, 2 from overshooting, 1 from air-to-air collision, 1 both-craft-on-ground collision, 3 in runway-approach.

Of the six accidents to fixed-wing general aircraft, 1 was a wheels-up landing, 1 gear collapsed, 1 gear retracted, 1 overshoot, 1 both-craft-on-ground collision, 1 collision with water, 1 unspecified.

Of the 33 accidents to helicopters, 3 were hard landings, 1 nose over, 5 collisions with ground, 1 with rising terrain, 3 with water, 5 with wires or poles, 2 with runway lights, 1 stall, 8 airborne accidents to airframe, 1 unspecified.

It should be observed that most accidents result from more than one factor. As a result there are more causal factors in CAB's statistics than there are accidents.

(Continued on page 41)

Accident Report

SWIFLITE AIRCRAFT CORPORATION, LOCKHEED PV-1, N 2000C, NEAR SMITHTOWN, NEW YORK, JANUARY 26, 1956

The Accident

A Lockheed PV-1, N 2000C, owned and operated by the Swiflite Aircraft Corporation, crashed and burned at 1633 on January 26, 1956, three miles west of Smithtown, Long Island, New York. Three pilots, the only occupants, were killed and the aircraft was destroyed by impact and ground fire.

History of the Flight

N 2000C took off at 1625 on January 26, 1956, from MacArthur Field, Ronkonkoma, Long Island, New York, its home base, on a local flight with three pilots. They were Bernard J. Malloy, check pilot, and Pilots Raymond Hamberg and Hugo D. Filangeri. The purpose of the flight was to qualify Pilot Hamberg on the Lockheed PV-1 aircraft, a type he had never piloted.

The takeoff of N 2000C was normal, toward the northwest, and made under VFR (Visual Flight Rules) conditions with Pilot Hamberg occupying the left or captain's seat and Pilot Malloy, as check pilot, seated on the right as copilot; Pilot Filangeri acted as observer. Subsequently the PV-1 was seen over the Smithtown area, flying westerly at an estimated altitude of 2,500-3,000 feet, where a witness reported that the engines sounded normal but that the aircraft appeared to be flying at a slow airspeed.

Witnesses stated that shortly thereafter the engine power sounded as though it was cut momentarily and then came back on. At an altitude of approximately 2,000 feet the aircraft was seen to dip down and pull up, slightly nose-high, and then fall off to the left, making two to three turns of a descending spiral, and disappear behind the tree-topped horizon. Flames erupted from the woods over the point where the aircraft was last seen, followed quickly by a large column of black smoke.

Investigation

N 2000C was found to have crashed and burned on the northerly side of a wooded knoll at about 200 feet m. s. l. (mean sea level) three miles west of Smithtown and three-fourths of a mile north of the Jericho Turnpike. The accident occurred at 1633, eight minutes after takeoff from MacArthur Field.

Impact marks revealed that after striking the top of a slender 40-foot tree, at an angle of descent of about 40 degrees, the PV-1 first struck the ground on its left side with the left wing down about 45 degrees, followed by the nose section, and both engines, and on a fuselage centerline heading of 205 degrees. Impact destruction was extensive; both wings were partly crushed and severed from the fuselage and both engines were torn from the nacelles. The steep angle of descent into the ground confined the aircraft wreckage to an area 93 feet long and approximately 50 feet wide.

Ground fire broke out immediately after impact and completely gutted the fuselage and center section. A considerable portion of the entire control system was destroyed and remainder did not reveal any control system irregularities. Because of the almost complete destruction in the cockpit area, the settings of controls, instruments, and trim tabs could not be determined. Other components such as the tail section, landing gear, and scattered pieces of wreckage showed evidence of intense heat but there was no indication whatsoever of inflight fire.

The position of the actuating cylinders indicated that all three landing gears were retracted. Both wing flaps were fully retracted. The flap actuating cylinder, with the piston at the top of the cylinder, provided corroborative evidence that the flaps were fully retracted when the PV-1 struck the ground.

Both engines were severely damaged by impact and extensively destroyed by fire after impact. Although the power sections of both engines were burned dry by ground fire, examination of the interiors did not reveal any evidence of inflight failures. Nine pistons, four from No. 1 engine and five from No. 2 engine, were consumed by fire but all the remaining pistons of both engines failed to reveal any evidence of preignition, detonation, or engine overspeeding.

Examination of the combustion chambers of all cylinders available disclosed that all were capable of normal operation. The crankshafts of both engines, although bent, were intact, as were the counterweight assemblies. Examination of these assemblies revealed no evidence of overspeeding or operational distress.

Both propellers suffered major impact damage. All blades, except No. 2 on the No. 1 propeller, were bent rearward in varying degrees, indicating a power-off condition at the time of the crash. This power-off evidence is also supported by the propeller dome positions and the blade shim plate markings which revealed that the blade angles of both propellers were at 26 degrees, the low pitch position for this propeller installation. This 26-degree low pitch position of the propeller blades can be obtained by a reduction of engine power, or loss of engine power and aircraft speed.

A review of the maintenance records of N 2000C revealed no discrepancies. Flight logs covering the year of operation prior to the accident disclosed no repetitious mechanical malfunctioning, and all pilot report items of mechanical difficulties had been readily and properly corrected. The aircraft was released for flight on the day of the accident, following completion of a 100-hour airframe and engine inspection.

Pilot Filangeri conducted the preflight examination of the aircraft and subsequently it was test flown for approximately 40 minutes, from 1440 to 1520, by Pilot Malloy with Filangeri, who had recently been promoted from copilot-mechanic to pilot. Pilot Hamberg, who had been observed sitting in the PV-1 while it was on the ground, familiarizing himself with the cockpit and equipment, accompanied the crew as an observer on this test flight, his first ride in a PV-1 type airplane. No discrepancies or "squawks" were found on either the Preflight Check Sheet or the Test Flight Check Sheet and so far as is known no complaints were voiced by the crew during the one-hour interval on the ground between the test flight and the last flight of N 2000C.

The flight first called MacArthur Tower and asked permission to make a test run on runway 28, which was granted. Then takeoff instructions for a local VFR flight were requested and the tower cleared N 2000C to runway 32 where a normal takeoff was made. This was the last radio contact the tower had with the flight. All radio communications between the tower and the aircraft were normal. A periodic inspection of radio installations and equipment on board the PV-1 had been completed satisfactorily the previous day.

The gross weight of the PV-1 on takeoff at 1625 was 26,259 pounds which was 4,741 pounds under the maximum allowable gross takeoff weight and the center of gravity was located within prescribed limits. The fuel on board was computed at 1,004 gallons.

At 1630, three minutes before the aircraft crashed, the U.S. Weather Bureau recorded a ground observation from MacArthur Field as: Ceiling estimated 4,000 broken, 6,000 overcast; visibility 15 miles; temperature 31; dewpoint 18; wind north 10 knots.

Pilot Hamberg, who had been hired by the Swiflite Aircraft Corporation eight days previously, was being given familiarization in the PV-1 so that he could obtain a rating to fly this type airplane. Two days before the accident he had satisfactorily passed a flight check on the company's DC-3.

Analysis

The duration of the flight was only eight minutes and while the witnesses' estimates of altitude during the last portion of the flight are below 3,000 feet, the performance capabilities of the aircraft and weather conditions (ceiling 4,000 broken, 6,000 overcast) would have permitted VFR flight at higher altitude. It is entirely possible that the aircraft was at 3,500 feet, or higher, at the time of beginning any maneuvers demonstrating performance of the PV-1, such as slow flight.

It is evident that the aircraft did descend from a higher altitude and then was observed to enter a spiral or start of a spin from a stall. Full recovery from this condition was not accomplished before ground contact.

The investigation covered all control factors to the fullest extent that the intense ground fire damage permitted.

(Continued on page 51)

Recipients of NBAA Annual Safety Awards

PAT WALKER AND VIC SWANSON *(center) presented the Safety Awards. They are shown with pilots who received the award in person.*

NBAA Member-Pilot Recipients of "Million Miler" Safety Awards.

1,000,000 or more accident- and injury-free miles flown in business aircraft.

1. **Robert F. Allen,** Frankfort Oil Co., Tulsa, Okla. 1,488,379
2. **Raoul Castro,** International Harvester Co., Chicago, Ill. 1,153,039
3. **L. P. Cornwall,** Chrysler Corporation, Detroit, Mich. 1,075,000
4. **W. R. Dotter,** International Harvester Co., Chicago, Ill. 1,141,216
5. **Al Eager,** Crane Company, Chicago, Illinois 1,071,000
6. **E. W. Estelle,** Esso Shipping Company, New York, N. Y. 1,516,250
7. **Harvey H. Glass,** Texas-Illinois Natural Gas Pipeline Co., Chicago, Ill. 1,296,000
8. **Robert L. Hansen,** Kroehler Mfg. Co., Naperville, Ill. 1,017,650
9. **W. P. Hobson,** Hercules Powder Company, Wilmington, Del. 1,161,299
10. **Jack C. Jones,** Fairbanks, Morse & Co., Chicago, Ill. 1,800,000
11. **James E. Kidd,** Anchor Hocking Glass Corp., Lancaster, O. 1,034,600
12. **Loren D. Kirby,** Universal Moulded Products Corp., Philadelphia, Pa. 1,046,544
13. **A. C. Korb,** Westinghouse Electric Corp., Pittsburgh, Pa. 1,000,000
14. **Robert J. Kusse,** Fruehauf Trailer Company, Detroit, Mich. 1,013,308
15. **J. Sheldon Lewis,** Thatcher Glass Mfg. Co., Inc., Elmira, N. Y. 1,108,000
16. **C. J. Lund,** International Paper Co., Mobile, Ala. 1,131,700
17. **S. M. Maxwell,** Burlington Industries, Inc., Greensboro, N. C. 1,107,915
18. **B. Owen Mayfield,** Hercules Powder Co., Wilmington, Del. 1,370,619
19. **George E. Meyers,** Monsanto Chemical Co., St. Louis, Mo. 1,150,000
20. **Norman L. Mitchell,** Minneapolis Star and Tribune Company, Minneapolis, Minn. 1,156,750
21. **Ralph E. Piper,** Monsanto Chemical Company, St. Louis, Mo. 1,152,000
22. **G. P. Rider,** Delta Drilling Co., Tyler, Texas 1,044,000
23. **Nelson U. Rokes,** The Procter and Gamble Co., Cincinnati, O. 2,800,608
24. **Thomas J. Schuetz,** International Harvester Co., Chicago, Ill. 1,140,969
25. **G. W. Sherwood,** Briggs Mfg. Co., Detroit, Mich. 1,182,060
26. **Orville E. Sparks,** Holley Carburetor Co., Detroit, Mich. 1,019,024
27. **D. M. Teel,** U. S. Steel Corp., New York, N. Y. 1,017,000
28. **Richard N. Thurston,** Monsanto Chemical Co., St. Louis, Mo. 1,226,048
29. **C. H. Von Hollen,** Union Bag-Camp Paper Corp., Franklin, Va. 1,200,000

TOTAL 34,105,978

NBAA Member-Pilot Recipients of 500,000 Mile Safety Awards.

500,000 or more accident- and injury-free miles flown in business aircraft.

1. **Wilbur D. Adams,** Procter & Gamble Co., Cincinnati, O. 670,680
2. **Howard E. Ahrns,** The Ohio Oil Co., Findlay, O. 829,420
3. **Warren E. Ames,** Hercules Powder Co., Wilmington, Del. 562,719
4. **Joseph J. Basso,** Columbia Geneva Steel, Los Angeles, Cal. 507,955
5. **Earle W. Bauer,** The Ohio Oil Co., Findlay, O. 655,260
6. **Ross K. Bennett,** Sangamo Electric Co., Springfield, Ill. 647,500
7. **Ralph W. Bryson,** Anchor Hocking Glass Corp., Lancaster, O. 510,000
8. **David H. Bishop,** Sinclair Refining Co., Tulsa, Okla. 833,230
9. **John A. Bouteller, Jr.,** Service Pipe Line Co., Tulsa, Okla. 950,187
10. **John Boomsma,** J. I. Case Co., Racine, Wis. 520,000
11. **Bill G. Davenport,** Service Pipeline Co., Tulsa, Okla. 975,617
12. **C. E. Dillahunty,** Shell Oil Co., Aurora, Colo. 700,500
13. **James M. Grogan,** Pillsbury Mills, Inc., Minneapolis, Minn. 810,000
14. **Norman A. Grele,** Fruehauf Trailer Co., Detroit, Mich. 500,160
15. **James G. Guess,** Burlington Industries, Inc., Greensboro, N. C. 911,275
16. **B. N. Haddock,** Falstaff Brewing Corp., St. Louis, Mo. 866,526
17. **Lane Hartwell,** Essex Wire Corp., Fort Wayne, Ind. 525,000
18. **Armond Hinkle,** Minnesota Mining & Mfg. Co., St. Paul, Minn. 572,220
19. **K. F. Horton, Jr.,** Sinclair Refining Co., Stamford, Conn. 727,860
20. **D. W. Hubbard,** Tobin Map Co., San Antonio, Texas 565,950
21. **Wilmer A. Ivey,** Southern Natural Gas Co., Birmingham, Ala. 640,397
22. **Harold K. Kaiser,** Walker Mfg. Co. of Wis., Racine, Wis. 611,290
23. **Charles S. Kincaid,** Service Pipe Line Co., Tulsa, Okla. 810,958
24. **C. R. King,** Esso Shipping Co., New York, N. Y. 754,730
25. **Clayton R. Kinney,** Burlington Industries, Inc., Greensboro, N. C. 628,900
26. **Joseph L. Lacey,** Sinclair Refining Co., Tulsa, Okla. 730,000
27. **Melvin C. Lora,** The Ohio Oil Co., Findlay, O. 807,260
28. **Glenn C. Lowe,** The Ohio Oil Co., Findlay, O. 531,417
29. **Russell A. McArdle,** Service Pipe Line Co., Tulsa, Okla. 625,683
30. **T. R. McFarland,** The Ohio Oil Co., Findlay, O. 513,055
31. **Clyde F. Martin,** Potlatch Forests, Inc., Lewiston, Idaho 503,404
32. **Samuel H. Massey,** Hercules Powder Co., Wilmington, Del. 575,979
33. **Ralph Matthews, Jr.,** Sawhill Tubular Products, Inc., Sharon, Pa. 864,380
34. **Allen F. Minich,** Sinclair Refining Co., Tulsa, Okla. 643,500
35. **Raymond H. Murphey,** Service Pipe Line Co., Tulsa, Okla. 916,244
36. **Stuart H. Murphey,** Esso Shipping Co., N. Y. C. 750,400

37.	**Carroll B. Nichols,** Service Pipe Line Co., Tulsa, Okla.	794,225
38.	**Walter C. Pague,** Armco Steel Corp., Middletown, O.	917,340
39.	**Roger E. Parrott,** The Fuller Brush Co., Hartford, Conn.	961,250
40.	**Don E. Phillips,** The Ohio Oil Co., Findlay, O.	737,340
41.	**Alton L. Rainwater,** Service Pipe Line Co., Tulsa, Okla.	844,600
42.	**Roosevelt Rammel,** The Ohio Oil Co., Findlay, O.	618,480
43.	**Don T. Richardson,** Minnesota Mining & Mfg. Co., St. Paul, Minn.	600,440
44.	**James M. Richter,** Columbia Geneva Steel, Los Angeles, Cal.	816,261
45.	**Richard R. Rigg,** Owens-Illinois Glass Co., Toledo, O.	650,273
46.	**Roy H. Rollo,** Columbia Geneva Steel, Los Angeles, Cal.	863,505
47.	**Herbert L. Sefton,** The Ohio Oil Co., Findlay, O.	653,000
48.	**W. W. Shepherd,** Shepherd Machinery Co., Los Angeles, Cal.	581,250
49.	**Stanley C. Smith,** New York Wire Cloth Co., York, Pa.	520,560
50.	**Aaron E. Spotswood,** Monsanto Chemical Co., St. Louis, Mo.	912,070
51.	**Edward L. Springer,** Service Pipe Line Co., Tulsa, Okla.	567,335
52.	**Frank J. Thera, Jr.,** Minnesota Mining & Mfg. Co., St. Paul, Minn.	529,550
53.	**Philip Van Treuren,** Dairypak Inc., Cleveland, O.	835,000
54.	**W. F. Underwood,** Sinclair Refining Co., Tulsa, Okla.	726,000
55.	**James D. Wallace,** The Procter & Gamble Co., Cincinnati, O.	502,920
56.	**James M. Wolfe,** Service Pipe Line Co., Tulsa, Okla.	529,424
57.	**William E. Wormald,** The Fuller Brush Co., Hartford, Conn.	625,000
58.	**Paul E. Wynn,** Service Pipe Line Co., Tulsa, Okla.	598,678
59.	**Richard A. Yoakam,** The Ohio Oil Co., Findlay, O.	631,130
	TOTAL	40,765,287

NBAA Member-Company Recipients of 1,000,000 Mile Safety Awards

1,000,000 or more accident- and injury-free miles flown in business aircraft.

1.	**Anchor Hocking Glass Corp.,** Lancaster, Ohio	1,430,000
2.	**Armco Steel Corporation,** Middletown, Ohio	1,174,248
3.	**Burlington Industries, Inc.,** Greensboro, N. C.	3,596,701
4.	**Champion Spark Plug Co.,** Toledo, Ohio	1,037,540
5.	**Cluett, Peabody & Co., Inc.,** New York, N. Y.	1,597,500
6.	**Columbia-Geneva Steel,** San Francisco, Cal.	2,632,885
7.	**Delta Drilling Company,** Tyler, Texas	1,044,000
8.	**Essex Wire Corporation,** Fort Wayne, Ind.	1,267,000
9.	**Esso Shipping Company,** New York, N. Y.	3,556,895
10.	**S. J. Groves & Sons Co.,** Minneapolis, Minn.	1,110,000
11.	**Hercules Powder Company,** Wilmington, Del.	2,292,112
12.	**Holley Carburetor Company,** Van Dyke, Mich.	1,286,852
13.	**International Harvester Co.,** Chicago, Illinois	1,937,250
14.	**International Paper Company,** Mobile, Alabama	1,897,557
15.	**Kroehler Manufacturing Co.,** Naperville, Illinois	1,752,200
16.	**Minneapolis - Honeywell Regulator Co.,** Minneapolis 23, Minn.	1,635,000
17.	**Minnesota Mining and Mfg. Co.,** St. Paul, Minn.	1,421,969
18.	**Monsanto Chemical Company,** St. Louis, Mo.	4,272,894
19.	**Owens-Illinois Glass Company,** Toledo, Ohio	1,816,265
20.	**The Procter & Gamble Company,** Cincinnati, Ohio	1,584,754
21.	**Southern Natural Gas Co.,** Birmingham, Ala.	2,493,862
22.	**Texas Gas Transmission Corp.,** Owensboro, Kentucky	1,100,000
23.	**Texas Illinois Natural Gas Pipeline Co.,** Chicago, Ill.	1,397,520
24.	**Thompson Products, Inc.,** Cleveland, Ohio	1,370,000
25.	**United States Steel Corporation** New York, N. Y.	1,285,240
26.	**Universal Moulded Products Corp.,** Philadelphia, Pa.	1,046,544
	TOTAL	47,036,788

Safety Exchange

(Continued from page 38)

In executive operation of fixed-wing aircraft, 10 contributing factors were ascribed to the pilot, 4 to maintenance or airport personnel, 1 to powerplant, 1 to accessory equipment, 3 to landing gear, 2 to weather, 1 "Miscellaneous" (i.e. explosion of gasoline fumes in aft fuselage).

Of the causal factors in the operation of fixed-wing general utility aircraft, 5 were ascribed to the pilot, 2 to other personnel, 3 to powerplant, 1 to accessory equipment, 1 to weather, 1 to terrain (soft ground).

In the operation of general utility helicopters, 20 contributing factors were ascribed to pilot, 2 to other personnel, 3 to powerplant, 7 to airframe failure, 12 to weather, 3 to terrain.

Emergency Airport Runway Marker

A new emergency flash marker for airport runways and repair areas has been developed by Burgess Battery Co. Visible for one mile, the "Radar-Flash" lantern gives over 50 hours of continuous flashing from two six-volt dry cells wired in parallel and sealed within a steel case.

For simplicity of operation, the "Radar-Flash" light-head is self-contained, without wires or spring contacts. The light-head is placed on the battery terminals and the two screw-caps tightened, and the unit is ready to operate. A steel carrying handle protects against accidental damage to the light-head.

The "Radar-Flash" units already in use by several municipal airports have proved more economical initially than conventional electronic emergency markers, and substantially more economical to maintain and service than old-fashioned kerosene flares.

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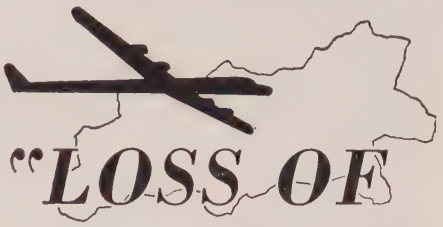

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CONVERSION #106

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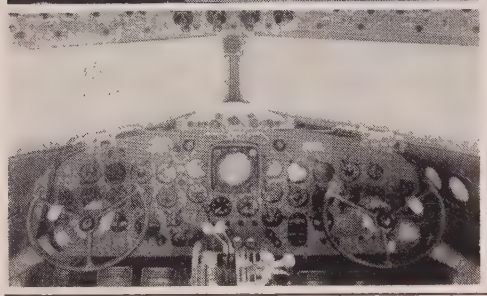

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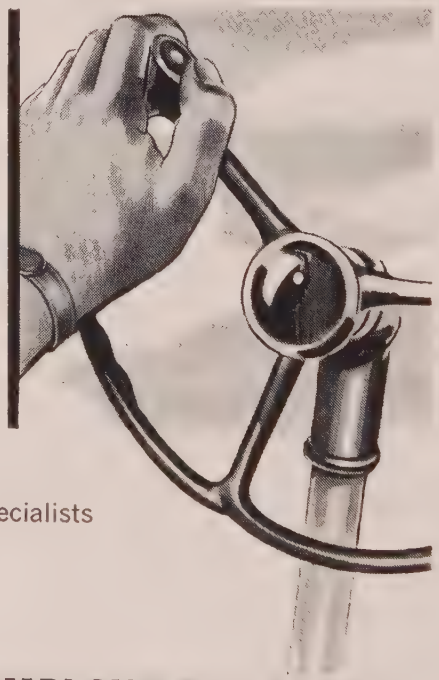

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Communications

(Continued from page 25)

proceeding along these lines, the results of which will depend, to a large extent, on the comments from you people as well as other aviation organizations.

"I would like to say this though as a word of caution; please don't come in on 123.0 for a little while.

"Now, at the present time and until we get our rules amended, if that be the case, we could not authorize it for this use. A rule making proceedings only requires about three months; we have been getting these R.T.C.A. reports for about ten days now."

Member of the Audience: "Am I to understand from this rule or this suggestion, that there would be one station allocated to the public at an airport, which does have a C.A.A. control tower, and all the fixed base operators would tie into this particular transmittal?"

Manhardt: "Well, I think I can answer that. The existing rules state one operator or one licensee at an airport would still apply to the recommendations for the frequency 123.0.

"The only difference between the two frequencies is that 128 will be authorized at airports not having a control tower and 123.0 will be authorized at airports having a control tower. There will be only one transmitting station at those airports.

Member of the Audience: "Could several operators pool their resources?"

Hawthorne: "That is possible. We have depended on the owner of the airport to designate and operate the station. Now, the designator and operator would receive an aeronautical station license and we would require in our applications that the applicant, if he is a fixed base operator, include a statement from the owner of the airport that he has been designated by the owner, for purposes of operating this station.

"Now, if there are several operators on the field and they wish to get together and make some arrangements like that, that certainly is within their own prerogatives."

Lacey: "Now, if I understand this thing clearly, on Miami International Airport, an operator could be designated by the airport's governing body. He then could purchase a transmitter and receiver on 123.0 which could be used for calling taxi-cabs, ordering hamburgers, making a date with the secretary of the airport. How far are we going to go with that?"

Hawthorne: "Gentlemen, actually this definition, although perhaps not as clear as it could be, is about as clear as we could make it in the R.T.C.A.

"The communications on these facilities would be limited to the official portal transit of which the flight is a portion. Now, we do not feel that a communication into this station, saying, 'Will you make me a doctor's appointment six weeks from now?' or 'a dental appointment six weeks from now' is any part of the definition 'from portal to portal transit.'

"We do feel that the request to have a cab waiting when you get there, certainly will get you to your hotel fast. You may request at the airport to have some box lunches ready when you are in a hurry or have a hamburger meal or a couple of steaks all set up for you when you arrive, so that you don't have to stay too long. Let's not go wild on this thing."

Member of the Audience: "I would like to make a suggestion. We have had a lot of trouble in the past with expiration dates of airborne transmittal licenses. Why can't the F.C.C. change the rule so that the license once granted to an aircraft transmitter be made in effect until, one, the transmitter would be changed or modified; or two, the airplane itself?"

Hawthorne: "Unfortunately, you are asking the wrong agency that question. You would have to ask that question from Congress.

"We amended our communications Act to the granting of licenses for a period no greater than five years.

"Now, for administrative reasons, we have aircraft which is designated four years as the basic extension of the license. The reason for four, rather than five years, is that we grant you renewal sometimes a month or two ahead of the time it expires, which would actually make it greater than four years, but we cannot exceed five years."

Member of the Audience: "I would like to ask the gentleman from F.C.C. a question. About six months ago we renewed our license for aircraft and then purchased a high frequency set and sent in a license renewal. We said in the information that it was on file for all of the transmitters which we had prior to this. We sent the information necessary on the new one and got it back. They wanted information, I believe, on all the old transmitters. Don't you keep a file on that?"

Hawthorne: "Either you are in error or we are in error. We do keep a file on all of that. The case is that when some new equipment comes out, and I am not taking a critical attitude when I say this, the manufacturers are a little slow in advising us of this. Occasionally we get the applications before we get the technical information from the manufacturers.

"When that happens, the bulk of the applications we get are normally returned. We don't sit and hold them and wait for the manufacturers to send them in. We found out that the best way to get the manufacturer to send them in is to return the application for this equipment.

"If we did go back and ask you for all of the equipment, we were in error, but I am very doubtful that we did, however."

Lacey: "If you are already licensed for a group of frequencies and you wish to have other frequencies, such as an HF, all you need is a license in addition. Am I correct?"

Hawthorne: "You file the same form whether it be for a new station or whether it be for a modification. And, if you are adding equipment, you will take the original letter that came with it, and you will say what you wish to get. We will send you a new piece of paper which is equivalent to what you had at the beginning, together with the additional equipment in additional frequencies."

Member of the Audience: "I would like to make one comment in defence of the F.C.C. here. It is quite a game we play. We bring out a new transmitter design. We sent it into the FCC. Then they are supposed to have this information on file. We call it by every conceivable name that could be used by the manufacturer.

"F.C.C. then is supposed to have this information on file. The last act in this play is when you guys apply under F.C.C. for a license on this new device and you think up *another name* to call it. They have just got a bunch of rubber-stamp experts that handle this mail that is going through. If it isn't on the list, it isn't on the list, and that is all."

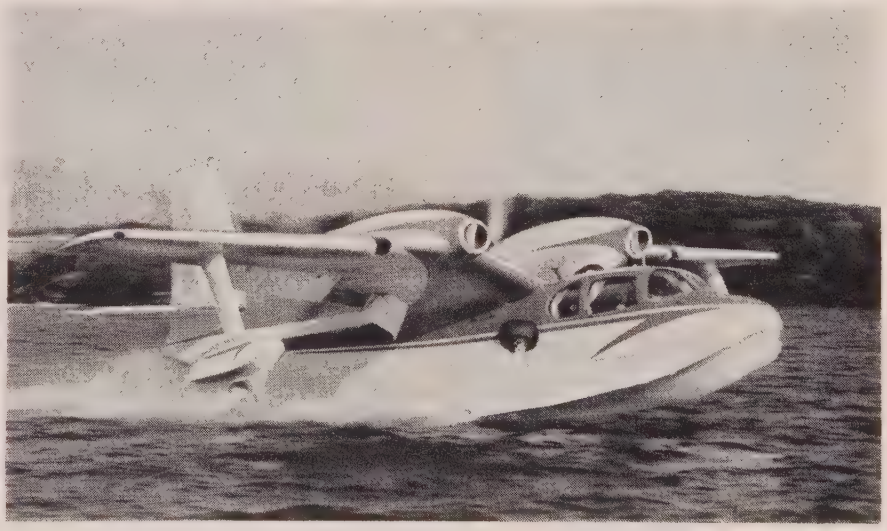
Hawthorne: "I would like to point out to this gentleman that I am not one of the ones he called rubber-stamps. The large majority of our applications are handled by five clerical members of our staff. If they are clearly O.K., in accordance with the guide lines we give them, they are granted and no one else sees them.

"If they are clearly wrong, they are returned. It is only those in between that get any further consideration.

Royal
AMPHIBIAN NEWS

Notes on America's outstanding utility amphibian for business flying and charter service operation

ROYAL GULL *SUPER 200* IS THE FASTEST LIGHT TWIN AMPHIBIAN FLYING TODAY



TAKE A "PORPOISE-FREE" RIDE in the new Royal Gull *Super 200*. The above picture shows the Gull on the step of its husky high-riding, long, sleek hull, just prior to a 14 second water take-off. The *Super 200* is powered with 340hp Lycoming engines.

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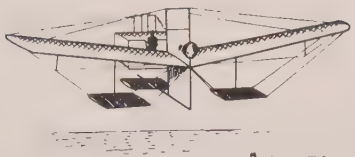
Timmins Aviation Limited, Montreal Airport, Dorval, Province of Quebec, Canada



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There are enough of those to keep me busy for the rest of my life."

Member of the Audience: "When can we hope to get some relief from the game of scrabble that is proceeding on 126.7? Do you think that the N.B.A.A. as a group, may concentrate on improved radio techniques themselves and thereby allow more time?"

Lacey: "Well, I am sure that 126.7 gets a little crowded especially when the weather goes from good to worse. Bert. do you want to say something on 126.7?"

Denicke: "Let me see if I can help you. It has been known for some time it's a mess. And it's getting messier every day. So the plan is to confine the use of 126.7 to IFR communications with the ground stations.

"The VFR type of communications will be continued on 122.1. I believe in that fashion we will get rid of a good bit of the stuff on 126.7.

"Also, the military, in their transition to UHF will reduce some of the load on that particular channel. In addition to changing from a mixture of VFR and IFR, maybe the VFR channel can double the frequency set up. You will use a different frequency on the aircraft, and in that fashion you will eliminate your 126.7 traffic which is the real headache.

"I think that the set-up of establishing a separate frequency for the ground and a separate frequency for the aircraft will take care of the situation."

Lacey: "May I ask a question here of these gentlemen on my own? I would just like to say that I am just an ordinary pilot and I don't know very much about communications and radio. Of course, 126.7 has been designated as that to be used for IFR traffic and 122.1 for VFR traffic.

"Is there any reason why we cannot use 122.1 to the ground station and have him reply on the omni-frequency? Would there be any objections to that from the governing bodies of the United States?"

Manhardt: "Joe, that is exactly what we have recommended in the SWG 13 report to the top ACC."

Lacey: "You have recommended it—but my question was, is it legal to do that under present regulations?"

Manhardt: "Yes."

Lacey: "Now, that I am safe, I can say I have tried it and it looks pretty good."

Manhardt: "The only thing that is necessary is to advise the ground channel on which channel you will expect a reply."

Lacey: "One more question here."

McKinnon: "Chuck McKinnon, I.B.M.; I would just like to ask you, what is the theory behind using 122.1 coupled with 122.2? It seems to me that the reason 122.1 isn't used is because we are using a crystal control receiver. We transmit on one and we have to go to another set to receive. I think you would get much more satisfaction if you could answer back on the same frequency.

"The converse of this is true also. If you transmit on 122.1 you don't know how many people are on the air at the same time."

Lacey: "Well, in order to use that type of technique, of course, you have to have other than a Simplex control on your transmitter-receiver combination."

McKinnon: "That is true. But most of us don't have that any more."

Lacey: "But it isn't too much of a difficult problem to arrange that, I believe. Maybe we should ask one of the experts from Wilcox Radio."

Bob Lee *(Wilcox Radio):* "Well, I would say it is pretty difficult to do that without having the second communication equipment.

"If you are going to transmit on 122.1 you have got to have the second receiver to receive off 122.2."

Lacey: "Thank you. Most of us, however, as I understand the problem, have navigation receivers which receive omni besides our communication set. It isn't too much of a problem if you have the equipment."

Norman Mitchell *(Minneapolis Star & Tribune):* "We have had an operational problem with some of these omnis that came up last summer. And on the 122.2 reply, it sometimes took as much as five minutes to get any answer. You could not get it on 126.7, so you tried 122.1 and 122.2 for a reply

"You hoped that this fellow on the ground would press his mike button so that you could hear him talking to somebody else. And then after three minutes or four minutes he switches over to 122.2 frequency and you find out that he has only one transmitter that he is talking on.

"Now, if you could hear him talking to somebody else you wouldn't have this problem turning up here."

Lacey: "Do we have comments from the panel on that?"

Manhardt: "I might make one brief one and that is the use of 122.2 from the ground station is a carry-over from the early transition.

"If you recall, we started out using 111.1 which was a VOR channel. It was installed at locations which did not have a VOR voice, with the intention of discontinuing that channel so that the other could be installed.

"Now, the intention as of today, is to discontinue 122.2 just so that we can get the VFR communication confined to 122.1 from the aircraft and one at VOR from the ground station."

Member of the Audience: "I think that brings up one good point. That is what we are having right now when we have close frequency separation. The tower, particularly in areas like New York, where you have three or four towers and maybe one megacycle or two apart, 119.3, 119.8, 119.1. A lot of us still have manually tuned receivers. When you try to decide whether you are listening to La Guardia, or Westchester or somebody else, and when they talk for five minutes saying nothing. I think somebody might point out that they should definitely make an effort to identify themselves more often."

Manhardt: "Actually, I believe that the whole situation is that due to the fact that we are using a geographical separa-

tion for protection. As a consequence, you have stations too close together using the same frequency.

"You are bound to hear someone else.

"We have had a number of reports that pilots going into one airport have acted on, fortunately without a mishap, instructions from another airport tower, operating on the same channel.

"Just to give you a broader picture, along the east coast over a stretch of about three hundred miles, there are fifteen control towers operating on the same frequency. So you are at a standstill except for the local control functions. We should have at least a two hundred mile separation between each tower.

"Now, you can't put fifteen more in three hundred miles on that basis. We are hoping that with the use of 100 K.C. spacing this year and next and then with 50 K.C. as necessary, we will be able to get sufficient separation between these A.T.C. facilities or functions, so that you will not have this interference.

"Moreover, the use of double channel operation for the higher altitude operations is going to help considerably."

Member of the Audience: "This may be very impracticable but personally speaking from experience, I am not interested in talking to the control during IFR except for landing instructions. Is it impracticable to assign us a frequency to receive messages which we can have for our own?"

Manhardt: "Well, from my own experience, I don't think you would like it after you had it. One of the problems in control facilities today is the multiplicity of channels to meet the different users.

"We are serving the military on VHF both in the civil and the military plan. The fellow doesn't know how to work them sometimes. He just works them all and as a result, if you had a special channel for civil and military aircraft, you would hear everything on the same frequency."

Denicke: "I might point out too that a large share of C.A.A. funds is going into the addition of peripheral communications, so that you will be talking to the controller instead of to the inside operator. It is one of the principles of dividing up an air control center into sectors. A sector is the amount of air traffic that one man can handle, one controller. He must have a direct communication with every aircraft in that area. If you add another frequency, that means you will be guarding three frequencies, for civil, VHF for military and a separate frequency for operating aircraft, so I think you have complicated it rather than simplified it."

Bill Dotter *(International Harvester):* "It isn't the problem of getting through. What I am driving at is when we are trying to get the station, we have 6700 other aircraft on that same frequency calling sixteen different stations around the country.

"And we have the situation where we are all cutting in on one frequency. How can I talk to this guy? Everyone is on 126.7—it is like an old-fashioned party line."

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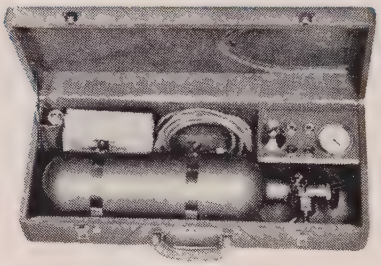

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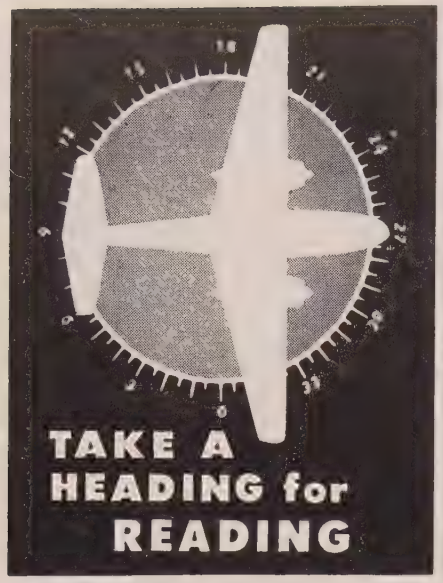

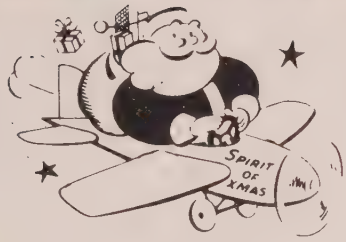

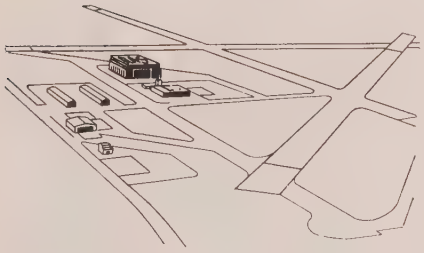

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Manhardt: "Well, is it the one frequency or is it the interference between aircraft?"

Manhardt: "Well, that was why we recommended that the aircraft use the different frequencies from the ground station, which will eliminate your air interference. I am not making excuses but it takes time and the best date which looks probable now in 1958."

Dotter: "You mean to get one extra frequency for us?"

Manhardt: "No, for the division of the IFR and VFR and the addition of a special ground air channel."

Lacey: "Well, I think the whole gist of the problem is the fact that your old 180 set will no longer do the trick. We have got to divide the 50 kilocycles and get 360 channels. The equipment is available at a number of places now for airborne.

"I don't know the progress of ground equipment, but apparently it will coincide with this date, 1958, and there should be double the frequencies used at that time.

Manhardt: "Joe, you know we talked about fiscal years and calendar years. You are more familiar with calendar years. I was speaking of the fiscal year 1958 which begins next July. Actually the date is by June 30, 1957, the calendar year and the ground air channel proposed is 120.7."

Lacey: "120.7 and that will be from air to ground; is that correct?"

Manhardt: "Ground to air only. We will still transmit, as we do now, at 120.7 but receive on a different frequency?"

Lacey: "Why can't the controller on the ground have his frequency, and your answer was that he cannot take care of all of them."

Manhardt: "Do you mean that if 126.7 was congested that you would move to the other?"

Dotter: "I think that is what the boys have in mind. If you don't get through on one, you go to the other."

Manhardt: "I don't think that you folks appreciate the extent of air interference as being the real cause of your problem. The only way you can eliminate that is to get off the single channel Simplex mode."

Member of the Audience: "No; you can hear the other man when he is transmitting."

Manhardt: "You don't want to hear him."

Member of the Audience: "Yes, you do. You want to hear him so that you can talk when he quits."

Member of the Audience: "I am over at San Antonio and I can hear everyone in Texas on 125."

Lacey: "In other words, he is asking for another Simplex frequency, the same as 127.

"Would you care to make a comment on that, Dick?"

Manhardt: "I don't think that is what you want."

Member of the Audience: "When this chap is getting air to air interference, the station he is calling is not necessarily getting him. If we have one more Simplex frequency and have an altitude break-off of air traffic up to 8,000, we would use 126.7 possibly or vice versa. The traffic from there on up would use that and this one Simplex. I think that would cut your air to air interference in half. The station you are calling is not getting all the interference from air to air."

Member of the Audience: "If we do have two Simplex channels with an altitude barrier, I think would probably cut air to air interference in half.

Lacey: "Will you comment on that, Dick?"

Manhardt: "Well, I think you would still have the same amount of air to air interference and that it will be more severe at the higher altitude."

Lacey: "Gentlemen, I regret that we have come to the end of our appointed time without completing our questions and answers. However, we have brought out some good points, and I hope the discussion has been a profitable one."

Henry W. Boggess (1) and The Hon. Joseph P. Adams at the Annual Awards Luncheon.

Del Rentzel, Toastmaster at First Niter.

. . . . in the business hangar

(Continued from page 33)

■ Pacific Airmotive Corp. Burbank Aircraft Div. is completing overhaul of wing panels and X-ray of attach fittings on Pacific Petroleum Co., Calgary-based Lodestar. Installation includes new instrument panel and nose pitot, custom radio by Qualitron. W. D. Brady is Pilot. ☐ Union Oil's PAC-based DC-3 is operating again after 100-hour airframe inspection and top overhaul on both engines. Chuck Wheeler is CP. ☐ Fairchild Aerial Survey's photogrammetric engineers flew one of the company's modified P-38's to PAC Burbank for top overhaul of the Allison engines. PAC is also installing a magnetometer in the Bell helicopter operated by Fairchild. Vernon Baird is FAS Manager of Flight Operations and NBAA rep. ☐ Consolidated-western Div. of U.S. Steel's PAC-based Twin Beech is undergoing 100-hour inspection and routine maintenance. Bill Bloes is pilot. ☐ A converted Northrop Black Widow operated by Jack Ammann Photogrammetric Engineers was in PAC for routine maintenance. ☐ PAC has completed turn-around and minor maintenance on Sharon Steel's Lodestar, A. M. Wilkins, Pilot; Texas Railway & Equipment Lodestar, Dick Robertson, captain; American Gilsonite Lodestar; DC-3 operated by Aerojet-General with Frank Dolinski at the controls; RCA's DC-3, Otto Pobanz, captain.

■ Santa Monica Aviation, Inc., completed installation of a complete Collins system in the new Aero Commander Super 680 delivered to Republic Supply Co., Los Angeles. Equipment included the 171-4 VHF transmitter, 51X-1A VHF receiver, 51Z marker receiver, 51V glide-slope receiver, dual 51R-3 Collins Omni system, Lear ADF-14 and Dare 22-channel standby VHF transmitter. Custom radio and instrument panels were also furnished. Flight crew: Capt. Harry Conover and James Keegan. ☐ Jim Dyerly brought the Beech Super 18 of McCulloch Motors Corp., Los Angeles, to Santa Monica Aviation for 50-hour inspection and line maintenance. ☐ The High Compression Aero Commander 560A just purchased by Randolph and David Hearst is being fitted with a Lear L-2 autopilot, ADF-14, LVTR-36 communications system, Lear 2200 marker receiver, ARC 15-D omni system with R-89 glide slope receiver. Custom radio panels and Zep oxygen system. ☐ Dare VHF-5 was installed in the Navion operated by Summers Gyroscope Co. ☐ North American Aviation, Inc., Inglewood, took delivery on an Aero Commander 560A from Santa Monica Aviation. Commander was equipped with Lear ADF-14, LTRA-6 with Omnimeter, marker receiver, LVTR-36, Collins 280-channel omni, ILS and glide slope system, and custom edge-lighted radio panel.

■ Babb Co., Inc., has delivered two Convair 240's to Trans Iranian Airways. Sales was made from part of the Convair fleet recently acquired by Babb from LAI Italian Airlines.

■ Two recent conversions which conform to specifications recommended by Flight Safety, Inc.: ☐ DC-3 operated by Union Bag-Camp Paper Corp., Franklin, Va. Plane is equipped with P&W R1830-75 engines, is certificated at T-O gross of 26,200 lb. Equipment includes Collins Integrated Flight System, C-4A Gyrosyn Compass System, dual RMI, dual Collins 51Ra VOR receivers, Collins 360-channel transceiver, Narco 1016 standby communications and Bendix X-band radar. DC-3 instruments, lighting and panel-paint conform to SAE specs. Radio and instruments in Union's E18S also conform to FSI standards. Union's Chief Pilot: C. H. Von Hollen. ☐ The new Aero Commander 680 purchased by Lukens Steel Co., Pittsburgh, will have radio and instrumentation installed by Reading Aviation Service to FSI specs. Weight was important in this installation, which included Sperry Gyrosyn Compass System, RMI, Collins and ARC Omni, Narco 1016 transceiver, Dare 22 channel standby transmitter, Wilcox glide slope receiver, and dual ARC ADF; provision is made for future installation of radar. CP Bill Austin worked with FSI to determine final configuration.

■ Dallas Aero Service has completed a new interior, 100-hour inspection, relicensing and new exterior paint job on the Lodestar belonging to Phillips Petroleum Co. ☐ The John W. Fisher Dove, Muncie, Ind., has been in the DAS shops for augmentors, Janitrol heaters, top overhaul, 100-hour inspection and new exterior repainting. ☐ The Chicago Tribune's de-Havilland Dove was flown to Dallas Aero Service by Parker Berge, Pilot, for new augmentors, flat auxiliary tank, Janitrol heaters, rotating beacon, new paint job and other miscellaneous services.

■ Aero Corp., Atlanta, recently made X-ray inspection of the executive DC-3 operated by Mine Safety Appliances, Pittsburgh. Pilot Lew Reinhold flew the DC-3 to Aero.

■ Remmert-Werner, St. Louis, installed Bendix RDR-X-band radar, with hinged radomes and swingaway scanner mount, on the three Dow Chemical Co. DC-3's. ☐ Ross Bennett brought the Sangamo Electric Co. Lodestar to R-W for installation of Bendix X-band radar. ☐ Husky Oil Co. D18S came in from Cody, Wyo., for 1000-hour inspection and relicensing. ☐ Hank Haddock and Bud Willett had Falsaff Brewing Co.'s DC-3 at R-W for new de-icer boots. ☐ Nationwide Insurance Super-92 DC-3 was brought to R-W for rudder exchange and other maintenance.

■ Hair Flying Service, Baton Rouge Lear distributor, recently completed installation of Lear L-2 in their own Cessna 310.

■ Tulsair Distributors, Tulsa Lear distributor, is installing ADF-12 in the Cessna 180 owned by Williams Bros. Pipeline Construction. Plane is going to Turkey. James Crawford is Chief Pilot. ☐ Recently completed ADF-12 and Omnimeter installation in Beech G-35 owned by R. A. Young Construction Co., Pilot Buehl Phillips. ☐ Installed Lear ADF-R14 in Beech E-18 owned by Texas Natural Gas Co., Elmo Maurer Chief Pilot.

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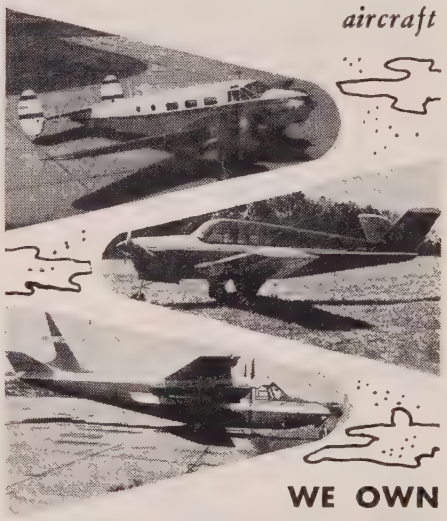

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Hangar Door

(Continued from page 27)

"Speaking of going home, we hereby sentence George Brewster, Chief Pilot, U.S. Weather Bureau, to duty at Thule INSAC station for not less than 90 days. Those of you who attended Thursday's award luncheon will recall that the Official Business of the meeting was prefaced by a straight-from-the-shoulder prognosis by friend Brewster relating to the expected weather northbound for Friday. Mr. Brewster had called the bossman at Weather Central in Washington, and we all gave George our undivided attention as he made with what we took to be the ungarbled word. The forecast for northbound flight, as he put it, was 'VFR—just high stuff with some light stratus through the Carolinas.' What George didn't mention, however, was that this 'light stratus' reached from 500 feet to 12,000 feet through the Carolinas, and also through Virginia, Maryland, Delaware, Pennsylvania, New Jersey and New York. We had to land twice because the INSACS were too busy to give us the en-route weather. Solid instruments for 600 miles—'communications wuz moider.'"

Airwork pasted round stickers on passers-by. The idea was to locate the person wearing the same number you had, and, split a bottle of champagne. If you *did* find the person with the same number, please tell us. If you didn't, better luck in Denver.

Pacific Airmotive Corporation invited everyone up for Aircraft Tank Service.

Mike Murphy sans leather jacket.

"We hardly recognized barnstormers Mike Murphy (Ohio Oil) Vern Carstens (Beechcraft) and Dick Hensen (Fairchild). Grey flannel suits (or checked sport-coats) instead of leather jackets! Tempora Mutantur?"

"Aero Commander's display gave a realistic feeling of flight, and enhanced the pictorial and model groupings of the new 680."

"A lot of roast beef trading was done by Carl Wootten, Aero Commander Sales Manager, during the banquet on closing night. Carl, one of the strange birds who like their meat well cooked, cringed when he saw a plate of crimson roast beef placed in front of him, and he immediately started trading, from

rare to medium rare to medium well and well, until he successfully rounded up the charred end piece, which he attacked with satisfied glee and a large saw. Everybody, including Carl, conceded that the food at the banquet was superb."

"At 9:30 AM on Wednesday the ladies took a bus ride to Viscaya, the palatial residence of Mr. Deering, which was presented to Dade County, on his death, as an art museum. The home and gardens are kept in their original condition, and the entire estate is one of the loveliest places in the world."

"The panel discussions were particularly effective this year, and full credit should be given to the moderators for not letting the boys generalize. In almost all cases the crux of the problems was discussed frankly and completely, and those seeking answers to their specific problems took home positive information." "Most of the post mortem criticism had to do with the shortage of time allotted to the panel discussions. We would rather hear that the discussions were too short than that they were too long. Things will be better next year at Denver. We will also try to do a better job on panel subject matter; the discussions of aircraft by type were set up to discuss mutual problems of maintenance rather than operation, and these two got switched around some." "The official word is that next year's forum will be held in Denver: received with great enthusiasm. Because this year's schedule was so jam packed with worthwhile activity, consideration is being given to making the Denver session a five-day meeting. This will be better all around. The manufacturers and services had really fine exhibits, and they deserved more attention than anyone running from one panel to another could afford to give them. This will also give everybody a chance to visit *all* the hospitality suites and have time to recover enough to sit up. Excelsior!" "Wolfgang Langwiesche, of 'Stick and Rudder' fame, told us how he was once stuck in the traffic pattern of a busy European airport until he had spelled out his full name in phonetics to a finicky tower operator. We trust this will never happen to P. H. Kutschenreuter of the U.S. Weather Bureau or to Spyros Sophianapoulos, who represented Miami University."

"Without question, the cleanest shaven pilot and industry representative was Gil Quinby of Narco. One of our scouts found out why. Now it can be revealed that, wherever he goes, Gil carries one of those Remington 'Home-Auto' razors that can be plugged in anywhere—hotel room, car, airplane, or a little battey which he carries in his shirt pocket. If you saw Gil duck out and hail a cab during coffee breaks, he wasn't on his way to visit an old acquaintance; he just took a ride around the block for a quick shave. His face sparkles like a Sapphire (advertisement)."

"In all the fun, there were plenty of serious moments. Emphasis was on the need for selling 'the boss,' industry in general, and the entire country on the value of the airplane as a business tool. Joseph Burns, toastmaster at the Wednesday luncheon, laid it on the line when he said, 'It's up to the business pilot to sell the airplane as an industrial tool.'"

THE SKYWAYS *display at the Forum featured the names and trademarks of many of the manufacturers and services who have helped to bring Business Flying to its present position as a vital industrial tool. Continuous developments in products and services ensure improvement in the safety and utility of Business Flying. Each month SKYWAYS, the official publication of NBAA, joins these advertisers in their efforts to make Business Flying practical, safe and efficient by reporting the progress of the industry to its readers.*

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New Portable Crystal-Controlled Transistor Oscillator

A new portable, crystal-controlled transistor oscillator has been announced by Kay Electric Company, Pine Brook, N. J.

The new Transilator, Model 125A, employs a pair of transistors and a unique diode feedback system in a battery-operated unit. Output frequencies of 1, 2 and 5 mc are available by rotating a selection switch. An external crystal jack is provided to furnish other frequencies falling between 1 and 5 mc (such as the 3.58 mc color carrier frequency.)

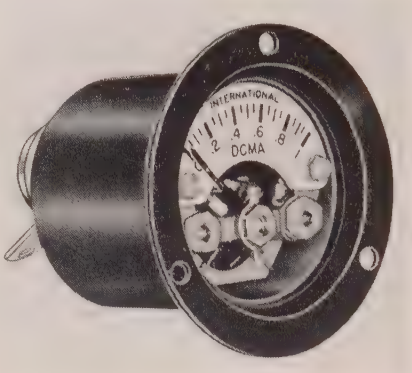
Because of its excellent frequency and amplitude stability, the Transilator may be used to calibrate oscilloscope sweep speeds and repetition rates, radar range units, and chroma circuits. This unit may also be used to calibrate oscillators by inspecting Lissajous figures. Three frequency adjustments are provided.

Output is 0.25 volt at 1000 ohms impedance level. Dimensions: 2 inches by 1¾" by 4½". Weight: 12 oz.

One-Inch Meter Gives Long Scale Arc

International Instruments Inc. of New Haven, Conn., announces production of a new 1" round panel meter for flush mounting. Designated the Model 104, this instrument provides the longest scale arc in the smallest possible panel space and is particularly adapted to portable, airborne and other similar equipment where high accuracy must be combined with minimum size and weight.

The flush mounting case is adaptable for mounting behind a panel with a cutout for the scale. By using the optional external shroud, the meter can be mounted from the front with a minimum projection from the panel surface. This latter application is, it is stated, particularly adapted for edge-lighting requirements.



Electrically Conductive Rubber Compound For Airborne Heat

A silicone rubber that will conduct electricity without wires is now commercially available. It is "Union Carbide" X-1516 Silicone Rubber Compound, a new product of Silicones Division, Union Carbide and Carbon Corporation.

Compounded with carbon black, X-1516 is conductive and can be molded, calendered or extruded without appreciably changing its electrical properties. X-1516 shows superior conformance to extrusion die contours and mold surfaces, so that it can be made into difficult or odd shapes. It could, for instance, be used to make a specially shaped electric heater and antifogging heater pads on aircraft cameras.

Possible use to make low-drag anticing boots for propeller, wing and control surfaces of medium and small business aircraft now lacking this protection, is not reported on. X-1516 is also used to provide an electrically conductive shield for silicone insulated electrical equipment.

Like other types of silicone rubber, X-1516 has thermal stability; inertness; resistance to weathering, corona and ozone; and adhesiveness, or the quality of not sticking.

Glass Cloth Flame-Resistant Tape For Use In Aircraft

A glass cloth flame resistant tape, especially suited for sealing and binding joints on high temperature duct work in aircraft has been announced by the Permacel Tape Corporation, New Brunswick, N. J.

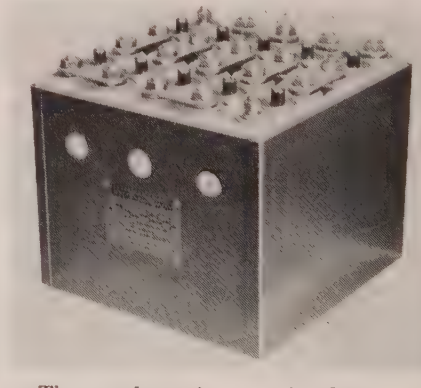
The tape, designated Permacel 621, also has wide application in the aircraft field other than on duct work. It can be imprinted and used for identification purposes in high temperature zones, and it can be used for sealing and protecting pipes carrying high temperature exhaust fumes. It is used for bundling, reinforcing, and holding applications where strength, abrasion resistance and permanency are required.

Permacel 621 is designed to meet military specifications which call for a flame-resistant pressure sensitive glass cloth tape. The tape is composed of a glass cloth backing and a self-extinguishing rubber base pressure sensitive glass cloth tape. The backing is flameproof and the adhesive will extinguish itself when the flame source is removed. Permacel 621 is available in 60 yard rolls in assorted widths.

Complete New Line of Nickel Cadmium Batteries

Ranging in sizes smaller than a cigarette lighter and from ½ to over 150 ampere hours capacity, a complete new line of miniaturized nickel cadmium sintered plate storage batteries has just been released by Nickel Cadmium Battery Corp. of Easthampton, Mass.

Virtually indestructible, these long-lived compact storage batteries will deliver momentary discharge currents for engine starting as high as 25 times rated ampere hour capacity. Capable of repeated cycle service, they have useful capacity in temperatures ranging from —40°F. to +165°F. They require little maintenance and can be stored indefinitely in any state of charge without deterioration or fear of freezing. Corrosive fumes are not given off and pressure release plugs prevent electrolyte spillage.



The new batteries contain plates composed of porous sintered nickel impregnated with nickel and cadmium oxides. The electrolyte is a solution of potassium hydroxide. Cell containers are of high impact plastic which are grouped in steel cases to form batteries.

Accident Report

(Continued from page 39)

The possibility of exterior control locks, incapacitation of the crew, and control interference by foreign objects was investigated but with negative results. Impact and fire damage could have destroyed evidence of control interference.

Damage by ground contact and fire precluded an accurate determination of engine operation. The examination of the engines indicated that they had been capable of developing normal power prior to the accident. Had power interruption occurred, without loss of control, the open areas below were suitable for emergency landings.

Normal and safe procedures had been followed before the subject flight as shown by the 40-minute test flight in which Pilot Hamberg acted as observer, the time spent by him on the ground in cockpit familiarization, and the practice takeoff roll made on runway 28 just before the actual takeoff.

According to experienced PV-1 pilots, stalls in this type aircraft are "extremely severe" and considerable altitude is lost before recovery. It appears that in this instance the pilot, while practicing familiarization maneuvers, permitted the aircraft to stall at a low altitude.

Findings

Upon consideration of all available evidence, the Board finds that:

1. The crew and aircraft were currently certificated.
2. The takeoff weight of the aircraft was more than 4,000 pounds under the maximum gross weight and the load was properly distributed.
3. Weather was not a major factor.
4. The altitude probably did not exceed 3,500 feet above the ground during the eight minutes the aircraft was in the air.
5. There was no fire prior to impact.
6. There was no evidence of failure of the airframe or malfunction of controls as far as could be determined.
7. There was no evidence of power failure of either engine.
8. The purpose of the flight was pilot familiarization and included slow flight.
9. The aircraft was observed to stall at low airspeed approximately 2,000-2,500 feet above the ground.

Probable Cause

The Board determines that the probable cause of this accident was loss of control resulting in a stall at an altitude too low to effect recovery.

By the civil aeronautics board: Joseph P. Adams, Harmar D. Denny and G. Joseph Minetti.

Durfee, Chairman, and Gurney, Member, did not take part in the adoption of this report.

The Aircraft

Lockheed PV-1, N 2000C, serial 5243, was manufactured in 1943 for the U. S. Navy. It was purchased from the Quaker Rubber Company on September 10, 1953. Total airframe time was 2,216:25 hours, with 1,458 hours since major overhaul, and 40 minutes since the last 100-hour inspection. The aircraft was equipped with two Pratt and Whitney model R-2800-31 engines and two Hamilton Standard model 23E50-505 propellers with model 6477A-12 blades. Time on the engines since overhaul was 149 hours and 67 hours. Time on the propellers since overhaul was 447 hours.

All times herein are eastern standard and based on the 24-hour clock.

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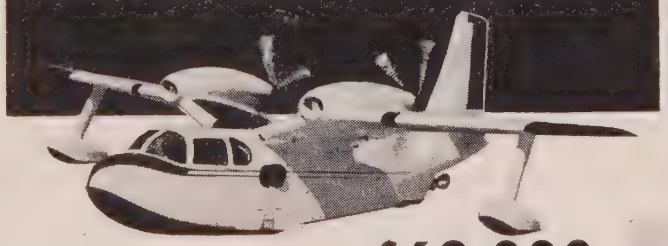

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TAL

Joseph T. Geuting, Jr., Manager of the Utility Airplane Council, was Toastmaster at the Annual Banquet and Honors Night. With Henry Boggess presiding, Honors Night featured addresses by George Halpin and Edward Rickenbacker, and the presentation of the Safety Awards and the NBAA Meritorious Award.

Flexibility the Keynote of Transport Conversion for G.E.

Temco Aircraft Corp. recently delivered to General Electric a converted C-54 transport which fulfilled the following requirements: the plane had to be equipped to board personnel at Cincinnati at the end of a day's work, provide dinner, conference accommodations, overnight facilities, and breakfast, and deliver the personnel ready for the next day's work at the Atomic Energy Commission test bed at Idaho Falls, Idaho. The plane was also to be used for transporting comparatively small, very heavy cargo units, in combination with passengers but in separate compartments.

To comply with the requirements, Temco mounted the passenger seats on tracks running the length of the main compartment. The tracks can also be used as support and tie-down for cargo. The carpeting in the passenger section may be removed in sections or entirely. There are no hatracks to interfere with full-cargo operation. Complete galley and lavatory facilities are in the aft compartment.

Separation of passengers and cargo is accomplished with portable bulkheads which may be used in two positions, swiveled to permit cargo handling with the bulkhead in place, or removed completely.

Garrett Expands AiResearch Laboratory Facilities

Construction has begun on two new laboratory buildings at The Garrett Corp.'s AiResearch Mfg. Div., Los Angeles. When completed, the new facilities will bring to over 150,000 square feet the total laboratory working area for the division.

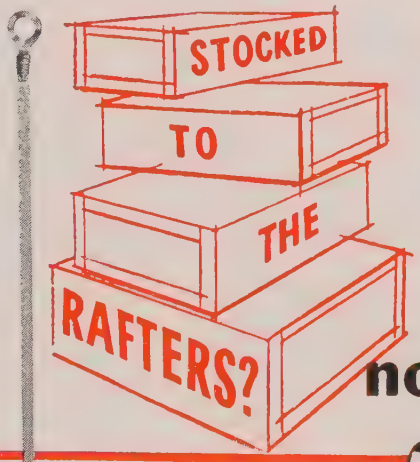
Largest of the new Los Angeles buildings will provide 6100 square feet of space, the majority of which will be used for expansion of electronics and flight instruments development programs, which include temperature, engine and flight control.

CAA, Canada Join in Checking New Helicopter

The first joint aircraft certification program between Canada's Dept. of Transport and the CAA is under way in connection with the Vertol H-21 helicopter.

Canadian aircraft certification is in this case based on U.S. standards. The H-21 program, however, is the first in which part of the work of investigating an aircraft is done by each country.

The H-21, a twin-rotor single-engine 20-passenger helicopter, has already seen extensive military service, particularly with the RCAF in connection with far-north radar stations.



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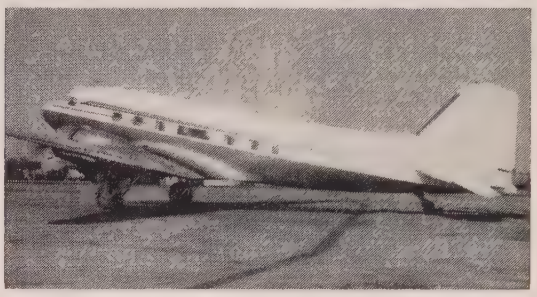

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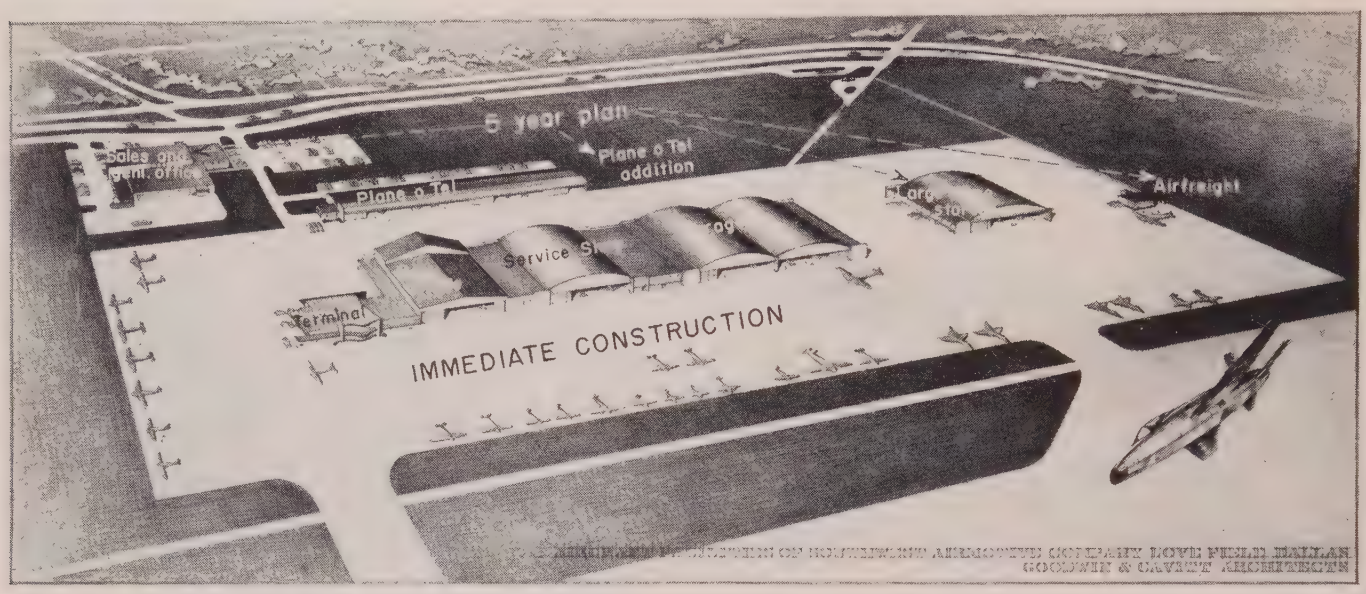

Southwest Airmotive Initiates $4,000,000 Five-Year Expansion Program for Love Field Facility

A $4,000,000 "five year plan" of new construction, approximately half of which is being implemented immediately, has been announced by Southwest Airmotive Co., Love Field, Dallas.

Work is now under way on the grading of the new 35-acre site, with pouring of an 11-acre concrete ramp due for completion by December 1st. Construction is scheduled to start shortly on a five-section 800 x 160 foot hangar and business aircraft terminal, and on a 400 x 80 foot "Plane-o-tel" storage hangar, to be completed during summer of 1957. Plans are completed for an air-conditioned sales, distribution and general office building. SAC Executive Vice President Winston Castleberry said the entire installation, when completed, will provide inside storage for "about 200 miscellaneous-size aircraft," and ramp area for a similar number.

When opened in 1957, SAC's major unit will provide storage, office and shop area already leased by the firm to major Dallas fleet owners, a section designed for the storage of Convair-size planes, the SAC aircraft, propeller and instrument shops, and a business airplane passenger terminal of modern design. Adjacent to the terminal is a pilots' lounge, a flight operations department, car rental offices, customer locker rooms, and headquarters for the refueling department.

An important feature of SAC's program is the company's contract with the City of Dallas. The City, which owns and operates Love Feld, guarantees the use of Love Field by private aircraft for at least 35 years. Immediate construction is being financed largely through $1.5 million in municipal bonds assigned SAC by the City, which SAC will repay in 15 years. Further steps in the firm's "five year plan" will be privately financed, using no more municipal funds.

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OILMAN: John Myers, former Lockheed engineering test pilot, says, "I wanted a comparison so I flew the Cessna 310 and others before I made up my mind. The 310 is extremely efficient, easy to handle. Its good power loading gives excellent acceleration, gets me into and out of short fields, easily."

CONTRACTOR: Rupert Chisholm's business interests are spread from Southern California to Alaska. Mr. Chisholm covers this territory in his own Cessna 310. "The more I fly it, the more I like it," says Chisholm. "The 310 is faster. Handles easy, too. I looked over a lot of airplanes before I bought my Cessna 310."

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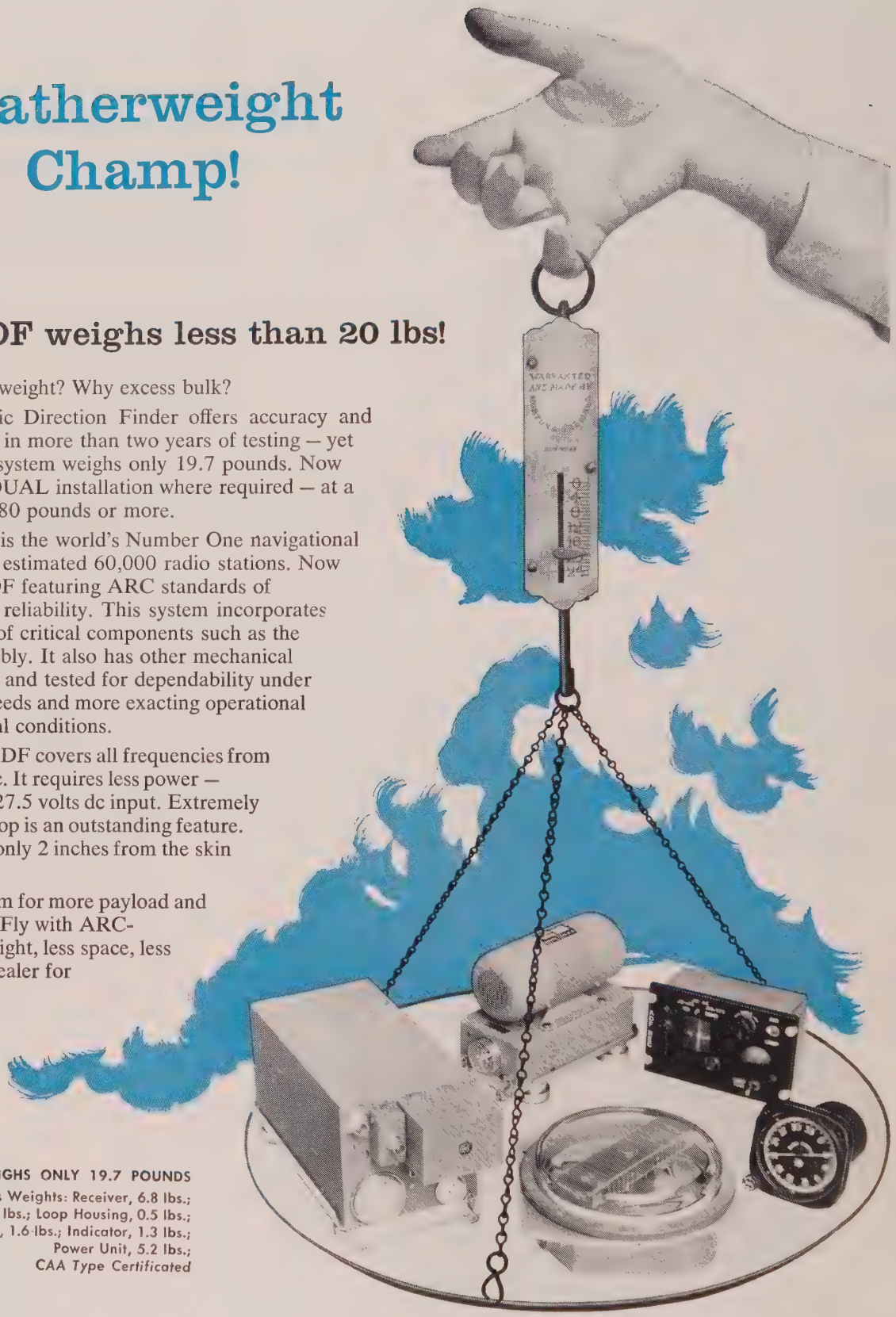

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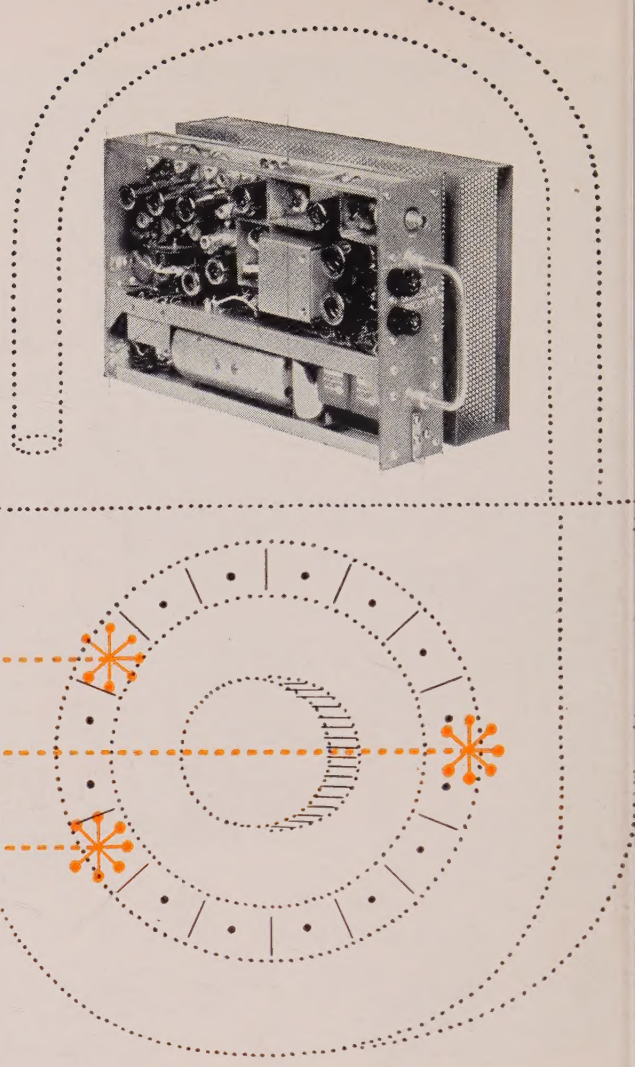

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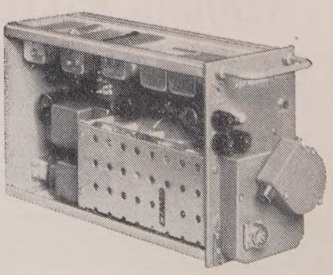

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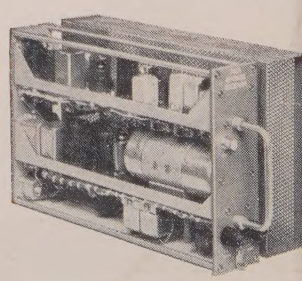

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